THE ORCHESTRA

VOLUME I

TECHNIQUE OF THE INSTRUMENTS



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VOLUME I.

TECHNIQUE OF THE INSTRUMENTS

BY

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PREFACE.

At length, after two and a half years of arduous work, the author has the satisfaction of offering to students the first part of his promised treatise on the Orchestra. The delay in its appearance has been due, partly to increasing pressure of professional engagements, but far more to the laborious preliminary investigations necessary to enable him to do some measure of justice to his subject.

In order that he might have at hand, when required, suitable examples illustrating every point that it might be needful to refer to, the author, before writing a single line of the text, examined nearly every orchestral score in his library. He consulted many hundreds of scores by the great masters, varying in length from a few pages to six or seven hundred, or even more. He made a list of some fourteen hundred passages for quotation or reference—far more, of course, than it would be possible to make use of, because, without such a list at his side, he knew that he would probably waste hours in hunting for a particular illustration when he required it. The result has fully justified his method of procedure ; for the actual writing of the volume has occupied a comparatively short time. The preliminary work, on the other hand, required more than a year and a half to complete it.

In planning the present work, it appeared advisable to deal first with the instruments of the orchestra individually, leaving till later the important subject of their combination, though this is of necessity incidentally shown to some extent in the examples given. After two preliminary chapters, treating of the qualifications needful to the student, of the composition of the modern orchestra, and of the arrangement of the score, the various departments of the orchestra, strings, wind, and percussion, are taken in turn, and the mechanism, character, and special features of each instrument explained in detail.

Without going deeply into scientific problems, it has been necessary to touch from time to time on questions of acoustics; for otherwise it would have been impossible to explain many points connected with the technique of the instruments. No further knowledge of acoustics is required than the student can obtain from such a work as Mr. Sedley Taylor's 'Sound and Music.'

In dealing with the different instruments, the author has endeavoured above all to be practical—with what success readers must judge. Many of the hints here given to students have been furnished to the writer by orchestral players, and much is to be learned from these gentlemen by those who have the opportunity of associating with them.

It will be seen that no mention is made in this volume of such instruments as are peculiar to military bands. Only those are spoken of here which, with more or less frequency, make their appearance in the regular orchestra. Scoring for a military band is a special subject, which lies apart from the scope of this work. Should space permit, (which, however, appears doubtful,) a supplemental chapter on this subject may possibly be added to the next volume. In any case, the present work, being a treatise on the orchestra proper, would be complete without it.

It will be seen that, although the organ is enumerated in Chapter II. among orchestral instruments, no mention is made of it later in the volume. The omission is intentional. What it is needful that the student should know about its technique will be found in Chapter XIII. of *Applied Forms*, while the subject of its combination with the orchestra will be dealt with in the second part of the present work.

The author's experience as a teacher has convinced him that many students do not know some of the instruments of the orchestra by sight,—cannot, for instance, distinguish between an oboe and a clarinet. It has therefore been thought advisable to give illustrations of most of the instruments spoken of. In a few cases this has been unnecessary, either because, as with the harp, everybody knows the shape of it, or because, as in the case of the serpent, the instrument is no longer in use.

The author offers no apology for the large number of musical examples contained in this volume. He has had more than one reason for introducing so many. In the first place,

he believes that nothing is so stimulating to the imagination of the student as the examination of passages from full scores. When a lad, his own enthusiasm for the art of orchestration—an enthusiasm which has never since abated—was first aroused by studying the few and short passages quoted in Hamilton's 'Catechism of Writing for the Orchestra'; and long before he had a large collection of scores of his own, he was familiar with every example to be seen in Berlioz's 'Instrumentation.' The author believes that that which was so beneficial to himself will also be found useful to the student.

Another great advantage in such short extracts as those here given is, that they are of much assistance in enabling the student thoroughly to master score-reading. If he has before him the score of a symphony or an opera, his attention is liable to be constantly distracted by the music as a whole; he will probably skim over passages to get the general impression of the melody or harmony, to say nothing of the chance of his being utterly lost in an elaborate score. But with short passages of only a few bars, in which there are few or no empty staves, his attention is concentrated, not distracted; and he will probably study these bars until he has at least a fairly good idea of the effect intended by the composer. Such a volume as the present, in which the effect of the examples in the earlier chapters is for the most part by no means difficult to realize, offers the student a graduated course of score-reading, such as he cannot possibly obtain by studying the works from which the various quotations are taken.

In the selection of examples two considerations have guided the author. Firstly, such illustrations have been chosen as best showed the special features of each instrument separately. In many cases important solo passages are given, and though the combination of the various instruments is touched on from time to time, no attempt has been made to deal with it systematically; this branch of the study belongs properly to the second part of the work. The other point is, that the author has tried, as far as possible, to avoid giving quotations from scores which were likely to be easily accessible to the student; such, in most cases, are only referred to. For the same reason, comparatively few examples are given which are to be found in the large treatises of Gevaert and Hofmann, though these books, being expensive, are not in the possession of all students. With the exception of some half dozen

passages, every quotation in the volume has been copied from scores in the author's library. He believes that many of the charming examples from the works of Cherubini and Auber, to say nothing of those from the less familiar compositions of Mozart, Schubert, and others, will be found both instructive and interesting.

One of the chief difficulties encountered by students in beginning to read scores is that of the transposing instruments. No attempt has been made to shirk this ; it has to be overcome, and the sooner the better. To give the earlier examples with the transposing instruments written at their real pitch, is like learning to swim with corks. But, in order to assist the pupil as far as possible, the transposition required is indicated at the beginning of each example, until the chapters are reached in which these instruments are dealt with.

It was originally intended to include in this volume the treatment of solo instruments,—that is to say, the scoring of chamber music; but the full description of their technique occupied so much more space than had been expected, that this subject had to be postponed. It will furnish the material for a chapter in the second volume.

The subject of orchestration is so large, and comprises such a multiplicity of detail, that a great part of the work still remains to be written. The second volume, which will follow the present one as soon as possible, will deal with the important subjects of combination, contrast, colour, balance of tone, accompaniment of voices, arrangements, the scoring for small, or incomplete orchestras, &c. It need hardly be added that no pains will be spared to make the work as complete as possible.

It would be dishonest of the author not to acknowledge his obligations to those who have preceded him in the same direction. While, as in other volumes of this series, he has founded his teaching on the actual practice of the great masters, he has found many valuable hints in the treatise of M. Gevaert, whose great work in two volumes, he considers to be by far the finest book on the subject ever written. In the matter of completeness, indeed, the present work has no pretension to rival that of M. Gevaert ; this would be impossible within the limits assigned to it, as will be readily understood when it is said that M. Gevaert's two quarto volumes contain about 900 examples. A few quotations from works which were not in

the author's library have been taken from R. Hofmann's 'Praktische Instrumentationslehre.'

The author desires to thank those publishers who have kindly allowed him to quote from their copyrights, and would especially name Messrs. Schott & Co. and Simrock for their liberality in this respect. He is also indebted to Messrs. Macmillan & Co. for permission to reprint the picture of the Contrafagotto from Grove's 'Dictionary of Music and Musicians.'

Once more the author has to thank his friends, Dr. C. W. Pearce and Professor Mahaffy, for kind assistance in revising the proofs. He is also indebted to his friend and former pupil, Mr. Joseph Spawforth, for the preparation of the analytical index.

London, November 1897.

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[*N.B.—The numbers refer in every instance to the* sections, *not to the pages.*]

The Orchestra.

PART I.—TECHNIQUE OF THE INSTRUMENTS.

CHAPTER I.

INTRODUCTION.

1. By the term 'Orchestration' is meant the arranging of a piece of music for various instruments. The term, however, is not generally applied to compositions written for solo instruments (such, for example, as quartetts or trios), but only to such as are written for the larger combinations of instruments usually spoken of as "an orchestra," or, colloquially, as "a band." Such pieces may be either purely instrumental, or they may be for one or more voices accompanied by instruments. In the latter case the word 'orchestration' refers simply to the manner in which the accompaniments are divided between the various instruments employed.

2. Other terms frequently to be met with as synonyms of "orchestration" are "instrumentation" and "scoring." The former needs no explanation; the latter has reference to the fact that the composer or arranger writes the parts for the various instruments on different staves, one above another, the whole collection of staves which are intended to be played together being technically known as the "full score," or simply "the score." Of the component parts of a modern score we shall speak presently.

3. The science of orchestration, as practised at the present day, is the most recently developed branch of music, being not much more than a century old. The present is not the place for a history of this subject, for which we would refer our readers to the valuable work of M. Henri Lavoix*, but a word or two may be said for the guidance of students.

4. Although in the scores of Bach, Handel, and their

* Histoire de l'Instrumentation, par H. Lavoix, *fils*. (Paris, Firmin-Didot, 1878.)

contemporaries, we not only meet with nearly every instrument found in modern orchestras—the chief exceptions being the different members of the clarinet family, the ophicleide, and the tuba—but also with many which are now obsolete, the manner of their employment is so different from that now adopted that the student will derive comparatively little benefit, from the point of view of orchestration, from the study of these works, highly interesting and instructive as they are in other respects. Modern instrumentation may be said to have originated with Haydn and Mozart, though more recent composers have made considerable advances in this department of their art.

5. Instrumentation is often spoken of as "orchestral colouring," and there is a great deal of truth in the simile. The orchestra is to the composer what his palette is to the painter. Some writers have fancifully endeavoured to compare the tones of different instruments to various colours ; but this is carrying the analogy too far. Yet if the student will compare the effect of, let us say, a symphony of Beethoven or Mendelssohn played as a pianoforte duet with the same work performed, as intended, by the orchestra, he will feel that in the latter case the various qualities of tone of the stringed, wood, and brass instruments give quite a different character to the work. The arrangement for the piano bears to the original much the same relation that an engraving does to an oil-painting. In the latter case there is *colouring*, which is wanting in the former.

6. The object of the present work is, therefore, to teach the student, as far as can be taught by an instruction book, how to use the various tone-colours which the orchestra offers him. But this is only possible to a limited extent. We can, of course, explain the compass, mechanism, &c., of the different instruments, and show how they can be used, and have been used, singly and in combination ; we can give general principles as to contrast, balance of tone, and similar matters ; but the feeling for orchestral colouring must be, like the invention of melody, a natural gift, and not the result of mere calculation. Here again the analogy with painting may be employed. An artist may have a thorough knowledge of every separate colour in his box, and yet not be a great colourist. Further, just as every great painter has his own peculiar style of colouring, each great composer has his own method of scoring; and it would be no more possible to an experienced musician to mistake a score of Mozart for one of Wagner than it would for an art-connoisseur to mistake a painting by Titian for one by J. W. Turner.

7. It may, perhaps, not be superfluous to remind the student that the most excellent orchestration will not compensate for

the absence of other merits in his work. It is quite useless for anyone to attempt to write for the orchestra before he has obtained a complete mastery of the other branches of composition. Here, again, the analogy with painting holds good. No sensible man would ever think of trying to paint a picture before he had thoroughly learned drawing and perspective. In the one case the result, judged as a work of art, would be just as incomplete as in the other.

8. In addition to the general knowledge of composition just spoken of, there are certain special qualifications needful for the student before he can approach orchestral writing with any hope of success. Of these one of the most obvious is the ability to read a full score. In the case of the older masters, such as Haydn and Mozart, this is a matter of no very great difficulty ; but to realize with the eye, even approximately, the effect of the more elaborate combinations to be found in such modern scores as those of Brahms, Dvořák, or Wagner is often a formidable task, requiring much practice and experience. Yet the ability to do this with tolerable ease is absolutely indispensable for anyone who would learn to write for the orchestra. A few hints to aid the student in this matter will be of use.

9. It may be assumed that his studies in harmony and counterpoint will have thoroughly familiarized him with the alto and tenor clefs, both of which are constantly to be met with in orchestral scores. A knowledge of the soprano C clef is also necessary ; for, though no longer employed for instruments, it is very generally used for the soprano voice in modern scores published in France and Germany, while it is almost universal in older editions of operas, oratorios, and other vocal works. If the student finds any difficulty with these clefs, we recommend him, as a preliminary study, to get some of the old editions of English church music, such as Boyce's or Arnold's cathedral music, or the anthems of Croft or Greene. In all these the soprano, alto, and tenor parts are written in the C clefs, and, as there is no accompaniment except a figured bass, the student will be forced to master these clefs if he would get any idea of the music. It will, of course, require some little time to acquire facility in reading them ; but it can be done, and it *must* be done, if his progress is not to be barred at the outset.

10. As soon as the student can read these clefs with ease he will be ready for the next step forward. We advise him to take some string quartetts for his first study in modern score reading. All the quartetts of the great masters, from Haydn downwards, are now to be had in score, for a few pence each, in the excellent Payne edition. Though the scores only contain four staves each, their reading will be found most useful

practice, owing to the independence of the parts. The student must endeavour to hear each part in his mind's ear distinctly and simultaneously. If he be a pianist, we advise him not to try to help himself by playing the pieces on the piano. In the first place, he will find many passages in which the harmony is so disposed that it cannot be played, as written, by two hands ; and, secondly, it is indispensable that he should acquire thoroughly the power of what the late John Hullah used to call "hearing with the eye."

11. When the score of a quartett or quintett no longer presents any difficulty, the student should proceed to the simpler orchestral scores, such as the symphonies of Haydn and Mozart. Here he will be confronted for the first time with the difficulty of reading the transposing instruments,—the clarinets in A and B, the trumpets and the horns. In the chapters of this volume in which these instruments are treated of, he will find full instructions on this point. The number of staves which he has to read simultaneously will now be increased, varying from six to ten or twelve; but the difficulty will not increase in the same proportion, as the wind parts in these older scores are mostly simple, and often of secondary importance, to say nothing of the fact that they often double the string parts, either in the unison or the octave.

12. The attention should not be confined exclusively to instrumental works; it will be well for the student also to make himself acquainted with the oratorios of Haydn (the 'Creation' and the 'Seasons'), and with the principal operas of Mozart. When he can read intelligently such scores as those of 'Don Juan' or 'Figaro,' all the worst of his troubles will be over. The scores of Beethoven, Schubert, or Mendelssohn will offer comparatively little difficulty then, though some of the modern works, such as Wagner's 'Tristan,' or Berlioz's 'Faust,' never become really easy to read, even for the most experienced musician.

13. Thanks to the diffusion of cheap music in recent years, and to the enterprise of some of the principal German and English publishers, the full scores of the works of the great composers are mostly to be had now at very reasonable prices. But if any of our readers are unable to obtain many of these, they may still acquire considerable facility in score-reading by carefully studying the numerous passages which will be quoted in the present work. It will not, however, be sufficient merely to get a vague general idea of them ; the student must carefully piece them together, so to speak, building up the chords (if necessary) a note at a time, until he is sure that he hears clearly in his mind's ear the effect designed by the composer.

14. This brings us naturally to speak of the second qualification needful for the student of orchestration, and one which is of at least equal importance with the power of reading a score. In speaking just now of hearing clearly "the effect designed by the composer," we meant much more than merely hearing the correct melody or harmony. It is quite impossible for anyone to write effectively for the orchestra unless he has at least a fairly good idea of the sounds he is putting on the paper. It is not enough, therefore, when he is reading a score to hear in his mind the right chords; *he must hear them with their proper quality of tone.* The chord of C major played by strings sounds absolutely different from the same chord in the same position played by clarinets and bassoons, or by brass instruments. The student must be able to call up in his mind at will, at least approximately, the tone of all the instruments in the orchestra, either singly or in combination.

15. It may be at once admitted that this is the most difficult of the preliminary tasks set before him in the study of instrumentation, and it can only be acquired by time and patience, the amount of the former varying greatly according to the opportunities enjoyed by the student of hearing orchestral music. To the dwellers in large cities such opportunities are frequent; but the young musician who lives in a remote country place labours under a great disadvantage. This is more especially the case as regards the reed instruments. Everybody presumably knows the sound of the violin, and nearly everybody would recognize the tone of a brass instrument, though many might be puzzled to distinguish between the sound of a horn, a trumpet, and a trombone. But nobody who had never heard an oboe or a clarinet could, like the German philosopher, evolve the idea of their tone out of his own moral consciousness; they must be heard before they can be identified.

16. Presuming that the student has, at least occasionally, the opportunity of hearing orchestral music, the best way of acquiring the power of which we are now speaking is the following. Supposing that he is going to hear some work, such as a symphony or overture, of which he has been able to buy or borrow the score, he should read the score carefully at least three or four times before going to the concert, using his utmost endeavours to imagine the quality of tone of the various passages. He should especially notice the solos for the different wind instruments, for these are they which at first will give him the most trouble. He should take the score with him to the concert, and remark particularly where the music sounds otherwise than he had imagined—and *why*. Sometimes he will probably have heard a passage in his

mind with the wrong quality of tone, at other times with the wrong balance of power in the parts. Then let him, as soon as possible after the concert, while his impressions are still fresh, read the score again two or three times, to fix in his mind what he has heard. The next time a similar opportunity presents itself, he will find that he can form a much more accurate idea beforehand of what he is going to hear, and with attention and practice, the power of which we are now speaking can be acquired to an extent of which those who have not tried it have very little idea.*

17. Closely allied with the faculty just treated of, and, in fact, almost a necessary corollary of it, is the converse power, which may be described as "seeing with the ear." By this is meant the ability, while listening to the orchestra, of telling by what instrument or instruments any particular passage is being played. This can only be carried to a certain extent. It may be doubted whether any one, however gifted, could, on hearing a chord played by the full orchestra, write it down exactly as it stood in the composer's score; but he should at least be able to tell pretty nearly what instruments are being used, and, in cases where only a few are employed, it would often be possible to write down the passage with absolute accuracy. This faculty of analysis will be of great use, not only in assisting him in score reading, but in developing his feeling for tone colour, so that in composing he may know what combination of instruments is required to produce a special effect, just as a painter knows how he must mix his colours to obtain a particular tint.

18. Some practical knowledge, even if only slight, of orchestral instruments will be of the utmost value to the student. Unless he knows something of the mechanism of an instrument, he is very likely to write ineffectively for it, even if he does not (as is sometimes the case with beginners,) write passages of almost impracticable difficulty. More especially is this the case with the brass instruments. The student's greatest trouble is probably in most cases the writing for the horns. If he can get even a few lessons on the horn, or (failing this,) on the cornet, he will find the knowledge thus acquired of the greatest service to him. The same is true of other instruments; and we strongly advise him to try his hand at as

* The author trusts he will not be thought unduly egotistical, if, for the encouragement of students, he gives his own experience. Living during all his boyhood in a small country town, he never had the opportunity of hearing a full orchestra till he was eighteen years of age, though by that time he had read a considerable number of scores. By pursuing the plan here recommended, he was able in a comparatively short time to make himself perfectly familiar with the tone of all the instruments, and could call them up in his mind at will, separately or combined. He can therefore speak confidently as to the practicability of the method; and the power once acquired will never again be lost.

many as he possibly can, even though he may not become really proficient on any.

19. No less valuable—from some points of view even more so—is actual experience in the orchestra itself, where this is obtainable. In this respect the students at our large music schools have an enormous advantage. To one who wishes to compose for the orchestra, nothing is more stimulating to the imagination than the frequent hearing of orchestral music. If therefore he has the opportunity of taking part in such performances, let him by all means avail himself of it, even though the orchestra should be poor or incomplete. Besides this, he may learn much from personal intercourse with the players, who can tell him many things about their instruments which it would be difficult to find in any instruction book. If not able himself to take part in orchestral performances, he should listen to as many as possible ; for it is absolutely beyond the power of any one to write well for the orchestra unless he is quite familiar with the tones of all the instruments.*

20. It must not be supposed that it is necessary for the student to defer commencing the study of instrumentation until he has completely finished the preliminary work of which we have spoken in this chapter. On the contrary, he will probably find much assistance in his task by reading the descriptions here given of the various instruments and their employment. But there is no short cut to writing for the orchestra. Sooner or later the qualifications here spoken of must be acquired, if the student would essay this branch of composition with any hope of success.

21. In the present work we shall first speak of the composition of the modern orchestra, and of the various ways in which the parts are arranged in a score. We shall next deal with each instrument in detail, after which we shall have to treat of their employment as solo instruments ; this will include the whole question of the scoring of chamber music. We shall then proceed to the practically exhaustless subject of orchestral combination, and shall conclude with some hints on arranging music for the orchestra, and on writing for small and incomplete orchestras.

* If the author may be pardoned one more personal reminiscence, he would say that he attributes much of his own knowledge of orchestral writing to the fact that he was for twenty-four years connected with the Crystal Palace, and during the whole of that time had opportunities of hearing the orchestra of that institution two or three times a week. It would be difficult to overestimate the benefit he thus obtained.

CHAPTER II.

COMPOSITION OF THE MODERN ORCHESTRA—THE ARRANGEMENT OF THE SCORE.

22. The instruments of which the modern full orchestra is composed may be divided roughly into three groups—stringed, wind, and percussion instruments. In the first of these groups the sound is produced by setting in vibration strings, made generally either of catgut or of wire. In wind instruments the tone results from the vibration of a column of air within a tube ; while in percussion instruments the tone is produced by the vibration either of a stretched membrane, or skin, as in the various kinds of drums, or of more or less elastic bodies, generally of metal, as in the case of bells, triangles, or cymbals.*

23. Each of these groups can be subdivided. Taking first the stringed instruments, there are three different ways in which tones can be obtained from strings. They may be set in vibration either by friction, as in the violin and other instruments of the same family, which are played by drawing a bow across the strings,† or by plucking the strings with the fingers, as with the harp and guitar, or with a plectrum (the mandoline), or by striking them with hammers, as in the old dulcimer, the modern pianoforte, and the Hungarian Czimbalom.

24. Of these three subdivisions the first is by far the most important, so much so, indeed, that when the term "strings" is used, instruments played with a bow are always intended. Of these, four varieties are employed in the orchestra—the violin, the viola, the violoncello, and the double-bass, or contrabasso.‡ The nature of each of these instruments will be explained later in this work ; it will suffice to say now that the violin is the smallest and the highest in pitch of the family, then comes the viola, next the violoncello, while the double-bass is the largest and deepest of the instruments.

* In the case of the rarely-used xylophone, the tune is produced by the vibration of bars of wood.

† In the hurdy-gurdy the tone is produced by the friction on the strings of a wheel revolving in contact with them. Though this instrument (*French* VIELLE, *German* LEIER,) is no longer used in the orchestra, it is mentioned here, as it is occasionally to be met with in the scores of Haydn and Mozart.

‡ Berlioz in his 'Orchestration' speaks of an instrument invented by M. Vuillaume, the 'Octobass,' the compass of which is an octave below that of the violoncello ; but it has never been generally introduced into the orchestra, the only instance of its employment known to the author being in the 'Benedictus' of Gounod's Cecilian Mass.

25. An important difference between the strings of an orchestra and the wind and percussion instruments is, that the parts for the first are always played by several instruments to each, while, excepting in the very largest orchestras, at grand festivals, &c., the wind and percussion parts are never doubled. The violins are almost invariably divided into firsts and seconds, each having an independent part, though they sometimes play in unison ; the violoncellos and double-basses also generally play in octaves.* The result is that music for the strings of the orchestra is mostly written in four-part harmony, arranged thus—

Violino 1mo.
Violino 2do.
Viola.
Violoncello e Basso.

('Basso' is frequently used as an abbreviation of 'Contra-basso.') For this reason the strings of the orchestra are sometimes spoken of as the "quartett,"—an inaccurate expression, which properly applies only to music written for four *solo* instruments.

26. Of the stringed instruments of the second class (those in which the strings are plucked,) only the harp is in ordinary use in the orchestra. The guitar and mandoline are also exceptionally to be met with. The pianoforte, the only important instrument of the third class, is hardly ever employed with the orchestra, except as a solo instrument, though examples of its use may be seen in Gade's symphony, No. 5, in D minor, and in Berlioz's 'Lélio.'

27. Wind instruments are often roughly divided into two classes, wood and brass. This division, however, is not strictly accurate, as some of the former, such, for instance, as the flute, are frequently made of metal. A much better classification is that founded upon the method in which the sound is produced. This gives three varieties. In the first, which includes the various kinds of flutes, the air in the body of the instrument is set in vibration by blowing through a round hole situated near the closed end of the tube.† The only flutes in general use in the orchestra of the present day are the ordinary flute, sometimes called the 'Concert Flute,' and the Piccolo, the pitch of which is an octave higher than that of

* For this reason their part in a score is often marked 'Bassi.' When the student meets with this word on the lowest staff of a score, he must understand that it always shows that the part is to be played by both instruments, unless there be a separate staff above it for the violoncellos, in which case 'Bassi' stands as an abbreviation of 'Contrabassi.'

† The old *flûte-à-bec*, and the modern flageolet, which are blown through the end of the tube, the construction of which resembles that of a penny whistle, or of a flue-pipe in an organ, are no longer used in the ordinary orchestra.

the large flute. Other varieties, more rarely met with, will be mentioned in their proper place.

28. The second group of wind instruments includes the various kinds of reed instruments. Of these there are two important subdivisions—those with a double, and those with a single reed. In both varieties the reed is placed at the end of the tube. The double-reed instruments have a conical tube, widening gradually from the mouthpiece to the bell. The most generally employed of these are the oboe and the bassoon. Less frequently met with, especially in older music, are the Cor Anglais, which is in reality an alto oboe, a fifth lower in pitch, and the double-bassoon, more often called by its Italian name, the Contrafagotto, which is an octave lower than the ordinary bassoon.

29. By far the most important of the single-reed instruments are the clarinets. Of these, as will be seen in a later chapter, there are several varieties ; we will now only mention, in addition to the ordinary instruments, the Corno di Bassetto (seldom, if ever, used now, excepting in military bands,) which bears the same relation to the clarinet that the Cor Anglais does to the oboe, and the Bass Clarinet, the pitch of which is an octave below that of the clarinet in B flat or A.

30. An important difference between these instruments and those with a double reed is that the tube of the former is cylindrical, that is, of the same diameter throughout, while in the oboe and bassoon it is conical. It will be shown later that this fact makes a great difference in the mechanism of the instruments. Single-reed instruments are also made with a conical tube ; but these—the family of saxophones—are at present almost exclusively confined to military music, though a few modern French composers have occasionally introduced them into the scores of their operas.

31. The third group of wind instruments is that which is generally known as 'the brass.' These instruments are played by means of a mouthpiece inserted into the smaller end of the tube. By varying the pressure of the breath, the player can obtain from them different notes of the harmonic series, while the length of the tube can be altered by means to be hereafter described when we come to speak of these instruments in detail.

32. The brass instruments commonly employed in the orchestra are the horns, trumpets, trombones, and (less frequently,) the ophicleide, or the tuba. Of these, the highest in pitch is the trumpet, which may be termed the soprano of the family. As good trumpet players are rare, the parts written for these instruments are frequently played on the cornet-à-piston—a much easier instrument to manipulate, but far inferior to the trumpet in nobility and beauty of tone. Its

use is, however, so general that some modern composers write for it in their scores instead of the trumpet.

33. Speaking in general terms, it may be said that the horn is an octave below the trumpet. We shall see later that this statement is only partially correct ; but for the present it will suffice to give a rough idea of the position, as regards pitch, of this instrument in the orchestra. We defer to a later chapter the discussion of the difference in quality, &c., between these various instruments; our present object is merely to enumerate the constituent parts of the modern orchestra.

34. Of the trombones, three kinds are in use in England and Germany, which, from their compass, are called respectively the alto, tenor, and bass trombones. In France and Italy only tenor trombones are employed; consequently, as will be seen later, French composers write for these instruments in a rather different manner from that adopted by the great German masters. It ought to be added that in many works, especially of the older composers, trombones are not used at all.

35. The ophicleide, which is to be found in many French scores of the first half of the present century, and which was employed by Mendelssohn in his 'Midsummer Night's Dream' and 'Elijah,' is now almost entirely superseded by the tuba, which, besides being easier to play, has a larger compass, more perfect intonation, and blends better with other instruments. Both the ophicleide and tuba furnish the lowest bass part of the harmony for brass. Neither instrument, however, is so frequently employed in the orchestra as the other members of this group ; like the Cor Anglais and the Contrafagotto, they can hardly be considered as *essential* parts of the orchestra of the present day.*

36. There remains to mention one instrument, which, though not generally included among the wind instruments, belongs to them rather than to either of the other groups. This is the ORGAN, which differs essentially from all the other instruments of which we have been speaking in the fact that while they are 'monophonic,' that is, producing but one note at a time, the organ is 'polyphonic,' and capable of full harmony. In the orchestra the organ is mostly used for the accompaniment of sacred music, though it is also sometimes employed in the opera. It is also occasionally treated as a solo instrument, concertos with orchestral accompaniment being composed for it. It is not, however, like other wind instruments, a regular constituent of the orchestra. The same remark applies to the harmonium, another polyphonic instrument, the tones of which are produced by the vibration of 'free reeds.'

* The Serpent, a wooden instrument played with a mouthpiece, though met with as late as the time of Mendelssohn, is now quite obsolete, and is only mentioned here because it is found in some of his scores.

37. We now come to the third group—the instruments of percussion. Of these, as already mentioned (§ 22), there are two classes, the first, in which the tone results from the vibration of a stretched membrane, being by far the more important. This is the family of drums. The only kind of drum which may be said to have real artistic value is the kettle-drum, for this is the only one which produces a distinct musical note ; all the others give only an indefinite sound. Every complete orchestra has at least two (frequently three) kettle-drums (*timpani*,) played by one player, and tuned to different notes. Occasionally more than one pair of kettle-drums is employed.

38. The other drums to be found, though less frequently, in the orchestra are the bass drum, generally known by its French name of *Grosse Caisse*, and the military, or side-drum. These are very seldom used in symphonic music, though they are not uncommon in modern operatic scores. Their chief use is in military bands and for dance music, in both of which kettle-drums are much less often employed. The tambourine, though not properly to be called a drum, also belongs to this family, as its tone is produced by the vibration of a stretched membrane.

39. The second class of percussion instruments—that in which the sound results from the vibration of metallic bodies—can also be subdivided into those which produce a distinct musical note and those which do not. The former include the various kinds of bells, and the Glockenspiel, the latter, the cymbals, triangle, and gong. The gong is only used for special dramatic effects; the cymbals and triangle (the latter especially) are much more frequently employed, their function being to mark the rhythm. To this class also belong the castagnettes, sometimes used in dance music, of which the sound, produced by the striking together of two pieces of wood, can hardly be called music, and ranks very little higher than the "bones" played by the corner-man of a troupe of nigger minstrels. The bells and Glockenspiel are only exceptionally used in the orchestra.

40. Having now enumerated the instruments employed in the orchestra, we proceed to tabulate them, marking with an asterisk those less frequently used.

I. Stringed Instruments.

(*a*) Instruments played with a bow :

Violin.
Viola.
Violoncello.
Double-bass (*Contrabasso*).

(*b*) Instruments the strings of which are plucked :

Harp.
*Guitar.
*Mandoline.

(*c*) Instruments the strings of which are struck by hammers :

*Pianoforte.

II. Wind Instruments.

(*a*) Instruments sounded through a hole in the side of the tube :

Flute.
Piccolo.

(*b*) Instruments played with a double reed :

Oboe.
*Cor Anglais.
Bassoon (*Fagotto*).
*Double Bassoon (*Contrafagotto*).

(*c*) Instruments played with a single reed :

Clarinet.
*Corno di Bassetto.
*Bass Clarinet.
*Saxophone.

(*d*) Instruments played with a mouthpiece :

Trumpet.
*Cornet-à-piston.
Horn.
Trombone.
*Ophicleide.
*Tuba.

(*e*) Polyphonic instruments :

*Organ.
*Harmonium.

III. Percussion Instruments.

(*a*) Tone produced by the vibration of a stretched membrane :

Kettle-Drums (*Timpani*).
*Bass Drum (*Grosse Caisse*).
*Side Drum.
*Tambourine.

(*b*) Tone produced by the vibration of metallic bodies:

*Bells.
*Glockenspiel.
*Triangle.
*Cymbals.
*Gong (Tam-tam).
*Castagnettes.

41. We said above (§ 25,) that the string parts in an orchestral work were always played by several instruments to each part. The number, however, varies widely in different orchestras, though the proportion of each part is (or at least should be,) approximately preserved. In a small orchestra there will probably be from six to eight first violins, about the same number of second violins, four or five violas, four violoncellos, and three or four (better *four*) double-basses. In a large orchestra, such as that of the Philharmonic Society, these numbers will probably be at least doubled; but, as the number of wind instruments will most likely be the same in both cases, the balance of tone will be very different in the two. This question is one of considerable importance: we shall return to it later in this work.

42. The wind and percussion instruments to be found in the ordinary full orchestra, as employed by Beethoven, Schubert, Mendelssohn, Brahms, and Dvořák, are the following:—

2 Flutes,
(sometimes a Piccolo in addition,)
2 Oboes,
2 Clarinets,
2 Bassoons,*
(occasionally also a Contrafagotto),
2, 3, or 4 Horns,
2 (occasionally 3) Trumpets,
3 Trombones,
1 Tuba (less frequently,)
1 pair of Kettle-drums,
(sometimes also Bass Drum, Cymbals, and Triangle).

43. If other instruments than these are required, the general practice has been to have them played by one of the performers on an instrument of the same family. Thus, the piccolo is often used instead of the second flute; the part for the Cor Anglais, when there is one, would be taken by one of the oboes, and that for a bass clarinet by one of the clarinet players. But of late years the tendency has

* In some modern French scores *four* bassoons are employed.

been to increase the number of instruments by using three of each kind of reed instrument. Thus in Wagner's 'Lohengrin' and 'Tristan,' we find two flutes and piccolo, two oboes and cor anglais, two clarinets and bass clarinet, and three bassoons, while the "Tuba mirum" of Dvořák's "Requiem" is no less fully scored.* We strongly advise the student to write only for the orchestra in ordinary use, as otherwise he will put a serious obstacle in the way of the performance of his music, should he be fortunate enough to get a chance of a hearing.

44. Before proceeding to speak of the instruments of the orchestra in detail, it will be advisable to say something concerning the order in which they are to be arranged in the score. Unfortunately there is no uniformity in this matter, though there are two systems now generally adopted, of which we shall first speak, mentioning afterwards the chief variations, and referring to such other methods of arranging the instruments as are now nearly or quite obsolete, but with which it is necessary for the student who reads scores to be acquainted.

45. An order to be seen almost exclusively in scores by French and Italian composers, though formerly very generally adopted also in Germany, consists in placing the three upper string parts (the two violins and viola,) on the three upper staves, then the wood wind (flutes, oboes, clarinets, and bassoons), below these the horns, trumpets and drums, and on the lowest staff the violoncellos and double-basses, which are written on the same line, excepting when there is an independent part for the violoncellos. If the score contain trombones, these are generally written above, but occasionally below the kettle-drums. In the operas of Meyerbeer, Méhul, and Hérold this arrangement is to be seen, and also in the first editions of many of the scores of Mozart and Haydn. Spontini in his 'Vestale' and 'Fernand Cortez' places the violas below all the wind instruments, and immediately above the basses—an inconvenient plan, which has nothing to recommend it.

46. The order most frequently adopted by modern composers, and in every way the best, is the following. The wood wind are placed at the top of the score, next below them are the brass, then the percussion instruments, and lowest of all the strings. With one exception, to be mentioned directly, the instruments of each group are arranged in order of pitch, exactly as is done with voices in writing a quartett or chorus. We have already seen this (§ 25,) in

* There are parts for piccolo, two flutes, two oboes, cor anglais, two clarinets, bass clarinet, two bassoons, contrafagotto, four horns, *four* trumpets, three trombones, tuba, timpani and tam-tam, besides the usual stringed instruments.

the case of the strings. Similarly with the wood, the flutes have the top staff, or staves, because, as we shall see later, these are the highest of all the wind instruments. Next come the oboes, then the clarinets, and lastly the bassoons. Generally two wind instruments of the same kind are written on one staff; this makes the score easier to read, as there are fewer staves to look at at once. But if the two parts are very independent, as in contrapuntal work, and especially if they cross one another much, it is better to take a separate staff for each.

47. If any of the less frequently used instruments spoken of in § 40 are employed, they are placed next to the other instruments of the same family. Thus the piccolo, being higher than the flute, takes the top line of the score;* the cor anglais is placed next below the oboes, the bass clarinet under the clarinets, and the contrafagotto below the bassoons. If other percussion instruments than the timpani are employed, these are placed between them and the strings.

48. The exception referred to in § 46 is found in the order of placing the brass instruments. Though the trumpets are higher in pitch than the horns, they are generally written below them in the score. The reason for this is, that the horns are so frequently used in combination with the wood that it is more convenient to write them on the next staves; it often makes the score easier to read. Below the horns come the trumpets, then the trombones, and lastly the ophicleide or tuba, if it is used. We have already incidentally said (§ 45,) that the trombones are occasionally placed below the drums; but it is much better to keep all the brass instruments together.

49. When the score contains a part for the harp, this is mostly placed immediately above the strings, but occasionally † between the violas and the violoncellos, while in Gade's 'Crusaders' it is exceptionally to be found at the top of the score. An organ part, when there is one, is generally either immediately above or immediately under the violoncellos and basses. In a concerto the part for the solo instrument is now usually placed above the strings, though in the older editions it was sometimes to be found at the top, and sometimes at the bottom of the score. In vocal music the voice parts are generally placed above the violoncellos, sometimes above the first violins, dividing the strings from the rest of the orchestra.

* In many French scores—*e g.* in those of Auber, where there is only one large flute and one piccolo, the latter is placed *below* the flute, because it is mostly played by the second flute player. The arrangement given in the text is not only more usual, but decidedly preferable.

† As in the scores of Auber's 'Le Dieu et la Bayadère' and Mendelssohn's 'Antigone.'

50. We now tabulate this arrangement, which we recommend students to follow :

Wood ... Flutes (Piccolo).
Oboes.
(Cor Anglais.)
Clarinets.
(Bass Clarinet.)
Bassoons.
(Contrafagotto.)

Brass ... Horns.
Trumpets.
Trombones.
(Tuba.)

Percussion Timpani.
(Grosse Caisse, &c.)

(Harp.)

Strings ... Violino 1.
Violino 2.
Viola.
Violoncello.
Contrabasso.

51. An important modification of the above order is sometimes to be found—mostly in French scores. This consists in arranging the whole of the wind (wood and brass together), according to their pitch. The instruments are then placed as follows :

Flutes.
Oboes.
Clarinets.
Trumpets.
Horns.
Bassoons.
Trombones.
(Percussion, Harp, and Strings, as above.)

52. A third plan, now no longer employed, but with which it is necessary that the student should be acquainted, as it is to be seen in many scores of fifty or sixty years ago, is that in which the instruments were arranged in their order of comparative importance, those least used being at the top of the score. The drums were on the first line, then the trumpets, horns, and trombones ;* below these the flutes, oboes, clarinets, and bassoons, and lowest of all, the strings.

* In the original edition of Schumann's 3rd symphony the trombones are separated from the rest of the brass and placed immediately over the strings.

53. It is only during the present century that any recognized system has been adopted in the arrangement of a score. In the original editions of the works of the great composers, the utmost disorder prevails. A few examples may usefully be given. In the score of Haydn's 'Passione,' published in 1801, we find, at p. 20, the wind parts in the following order:—horns, oboes, flutes, clarinets, bassoons, trombones; at p. 58 in the same volume the flute is above the oboes, and the trombones are above the bassoons. Even more irregular is the disposition of the instruments in the score of Cherubini's 'Lodoiska' (1791). In the overture the parts are arranged thus:—drums, horns, trumpets, oboes, clarinets, flutes, 1st violins, 2nd violins, viola, bassoons, trombones, basses. To this must be added that many of the old scores (*e.g.* the first edition of Mozart's 'Don Giovanni') were printed in oblong folio, the result being that in many cases there was not room on a page for all the lines of the score. In this case the least used instruments (generally trumpets and drums), were printed in an appendix at the end of the volume. In the score of 'Lodoiska,' just mentioned, though not oblong, the whole of the wind parts of the third finale are thus given, and it is all but impossible to realize the effect of the movement without writing out a fresh score. The student must be prepared for such irregularities as those here noted, and others which we have not space to enumerate, whenever he is examining the older editions of full scores.

54. We have thought it advisable to enter in some detail into this subject, as it is one which is likely to give the student trouble if he approaches it without previous preparation. The usual plan of writing the names of the instruments once for all at the beginning of a movement renders it necessary that we should know in what order we are likely to find them. Wagner in his later scores indicates the instruments at the beginning of every line. With an orchestra so large as that for which he writes (§ 43), this is a great convenience, almost a necessity; but with the ordinary orchestra the arrangement is now so systematic that it would be superfluous to repeat the indications on every page. If the student is thoroughly familiar with the regular order of the instruments, he will soon learn to recognize and remember any variations he may meet with.

CHAPTER III.

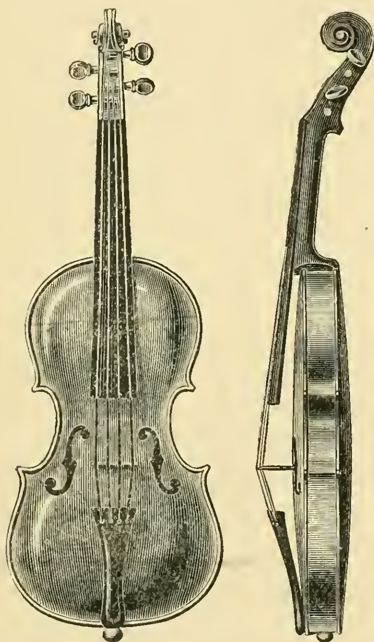
STRINGED INSTRUMENTS: THE VIOLIN AND VIOLA.

55. The stringed instruments spoken of in §§ 24, 25, (more accurately, though less frequently described as "bowed instruments,") may be regarded as the groundwork of the modern orchestra; and it is with these, therefore, that the student should first become acquainted. There are several reasons for the importance given to them in orchestral writing. In the first place they have between them a very extensive compass. From the lowest note of the double-bass [music example] to the highest note found in orchestral music for the violins [music example: 8va.] is exactly six octaves; and although the extreme upper notes are very seldom met with, it is by no means uncommon in modern music to find violin passages written up to A or B *in alt*, thus giving the strings a range of five octaves and a half. Consequently, anything which a composer wishes to write can, so far as its compass is concerned, be played on one at least of the stringed instruments.

56. Another important advantage possessed by stringed over wind instruments is that of their facility of execution. This applies more especially to the violin. Almost any passages, however rapid, are practicable on the violin; the exceptions will be noted later in this chapter. The same may be said of the viola and violoncello, though very rapid passages are less frequently written for these instruments; on the double-bass, owing to the greater length and thickness of the strings, such passages are less effective, and in some cases impossible to perform clearly. It is also possible on stringed instruments, as will be seen presently, to produce more than one note at a time—a resource not at the command of a player on a wind instrument.

57. It must further be noticed that it is far easier to obtain different gradations of tone on stringed than on wind instruments. This is more particularly the case as regards *pianissimo*

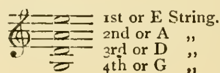
effects, which are equally easy to produce in any part of the compass. One other point remains to be mentioned. Strings can be played continuously for any reasonable length of time without fatiguing the performer. With wind instruments, on the other hand, it is necessary to introduce rests from time to time, not only for the sake of the player's lungs, but also for his lips, the muscles of which absolutely require intervals of repose, without which it would soon become impossible to obtain what is technically known as a proper *embouchure.* For all these reasons, the most important work in the orchestra is always allotted to the strings, though this, of course, does not exclude the frequent employment, for more or less extended passages, of wind instruments alone.



THE VIOLIN.

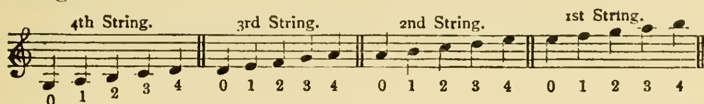
THE VIOLIN.

58. The violin, music for which is invariably written in the G clef, has four strings, which are tuned in perfect fifths, thus :—



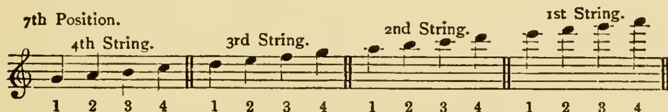
It must be said here, once for all, that on all stringed instruments, that string which gives the highest note is always called the *first* string. To obtain the intermediate notes between those produced by what are called the "open" strings, *i.e.* strings not touched by the fingers of the left hand, each string is artificially shortened by pressing it against the finger-board with one of the fingers. The result of this is that the part of the string between the finger and the "nut" of the violin, being held close to the finger-board, is unable to vibrate, and the tone is produced only by the part which lies between the finger and the bridge. In other words, the finger becomes an artificial "nut." If the left hand of the player be close to the nut, the notes produced by each finger on the four

strings will be the following. The sign o indicates the open string :—



It will be seen that, excepting G, each of the notes sounded by an open string can also be produced as a stopped note on the string immediately below it. It must further be said that the intermediate semitones are produced with the same fingering. Thus, on the fourth string the second finger can equally well play B flat instead of B natural, or the third finger C sharp instead of C.

59. But the compass of each string is by no means restricted to the interval of a fifth shown in the above table. By means of what is technically called "shifting," that is moving the left hand up the neck of the violin toward the player, many other "positions" are possible. Of these, eleven are practicable, but not more than seven are in general use ; those above this would only be employed on the first string when the most extreme high notes of the instrument are required. The student who does not play the violin himself will have no difficulty in understanding these positions, if he will remember that each is one note higher than the preceding. We have seen that in the position given in § 58, called the "first position," the first finger stops A, the second B, and so on, on the G string. Now if the hand is moved along the neck of the violin so that the first finger stops B instead of A, it is clear that all the other fingers will produce a note one degree of the scale higher than before. This will be the second position. If the first finger stops C, we have the third position, if D, the fourth, and so on till we reach the seventh position, in which a scale played on the four strings in succession will evidently be seven notes higher than that which we obtained in the first position.



It is easily seen that, the open strings being now unavailable, we have only four notes on each string, instead of the five of our previous example.

60. From what has been said in the last paragraph, the student will see that each string has a compass of considerably over an octave. As this book is not a violin tutor, this is not the place to discuss the particular position in which

any passage should be played; that is a matter which concerns the executant rather than the composer. The higher positions were hardly ever used in orchestral music by the older composers. Even Haydn and Mozart seldom, except in solo passages, wrote above F (5th position) [music notation].

Beethoven was the first to write extreme high notes for the violin. In the final movement of his overture to 'Egmont' we find the C *in altissimo*, a note which only can be reached in the ninth position.

61. Though in general the position in which a passage is to be played is left to the performer, we not infrequently find a particular string (most frequently the fourth,) indicated by the composer for the production of a special effect, as in the following well-known passage :—

Ex. 1. *Larghetto.* Beethoven : Violin Concerto.

Sul G e D. &c.

Here Beethoven wishes the whole melody to be played on the G and D strings ; this will, of course, be in the higher positions. The reason is, that the lower strings, especially the fourth, have a different quality of tone in their upper parts, probably because of the different relation between the length and the thickness of the vibrating portion. It is difficult to describe in words the exact difference in tone ; the student should, if possible, get a violinist to play a passage to him on the D string, and then to repeat it on the G string; but it may be said that there will be less brilliancy but more fulness and body of tone in the latter case than in the former.

62. The passage quoted above is written for a solo violin; but the effect of a large number of violins all playing on the fourth string is far greater than that of a single instrument. A fine example of this effect is found in the first act of 'Lohengrin' :—

Ex. 2. *Langsam.* Wagner : 'Lohengrin.'

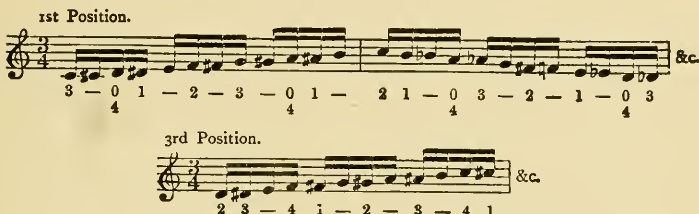
&c.

pp Nur auf der G Saite. (Only on the G string.)

Every one who has heard Wagner's great work will remember this passage, played by the whole mass of the violins, both firsts and seconds. In many cases orchestral players

prefer to render an expressive melody in this way, even where it is not specially prescribed by the composer.*

63. It was said above (§ 58,) that the intermediate semitones of the chromatic scale were played with the same finger as the diatonic notes nearest to them. Thus in playing a chromatic scale, a violinist generally fingers as follows :†



There are two points to notice about these scales : first, that in the first position, as with a diatonic scale, the notes D, A, and E can either be played on the open strings or with the fourth finger ; and secondly, that the first, second and third fingers are each employed for two consecutive semitones, and the fourth finger only for one note. It will be self-evident that this successive use of the same finger twice makes rapid chromatic scales much more difficult to play than diatonic.

64. Another important point to be borne in mind is, that in the higher positions the notes lie closer together than in the lower ones ; in fact the relative position of the fingers varies with each new "position." Purity of intonation is therefore more difficult on the higher notes than on the lower, especially with rapid chromatic passages. It must be understood that we are not advising the student to avoid chromatic passages altogether, but only to exercise care and judgment in writing them.

65. Shakes, either with a major or minor second, are practicable throughout the whole compass of the violin, but it should be noticed that those with a minor second are difficult (and therefore very seldom employed) on the extreme high notes of the instrument, because of the semitones lying so close together on the string.

66. Almost any variety of bowing and phrasing is possible on the violin. It is most important for the student to remember that the bowing he wishes *must in all cases be carefully indicated*, because, if nothing is marked, violinists

* Another modification of tone is obtained by drawing the bow across the strings near the bridge—indicated by "sul ponticello" (*Ital.*), "sur le chevalet" (*Fr.*), or "am Steg" (*Ger.*), which gives a peculiar aërial quality to the tone. A good example of this effect will be found in the second of Edvard Grieg's 'Zwei elegische Melodien für Streichorchester,' Op. 34.

† These two chromatic scales are taken from F. David's 'Violin Schule.'

invariably detach every note. It will also be advisable in *legato* passages not to put more notes under one slur than it is possible to play with the same bow, because the change from an up to a down bow, or *vice versâ*, necessarily causes a break in the continuity of the sound.*

67. We now give some examples, from the works of the great masters, of some of the most frequently used bowings.

Ex. 3. *Andante con moto.* SCHUBERT : Symphony in B minor.



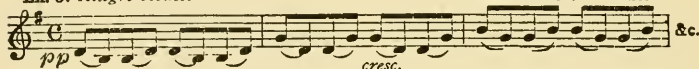
Here is a very simple *legato* passage ; the bow is changed at the third and ninth bars in order, probably, to render the *sforzando* on the F and D easier and clearer.

Ex. 4. *Allegro spiritoso.* HAYDN : Symphony in D.



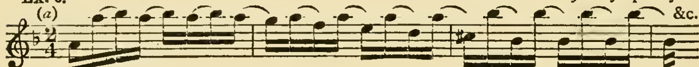
This is an instructive example. Notice how Haydn, after taking two bars with one bow for the first six bars of the passage, indicates a separate bow for each of the notes marked *sf*, to secure a stronger accent. In our next quotation

Ex. 5. *Allegro vivace.* BEETHOVEN : 'Fidelio.'

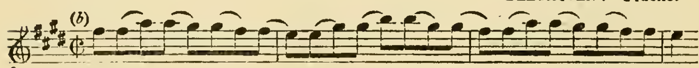


two notes are played with each bow. The same can also be done against the accent, producing an effect of syncopation.

Ex. 6. *Allegro ma non troppo.* BEETHOVEN : 9th Symphony.



BEETHOVEN : 'Fidelio.'



* Even experienced composers are sometimes careless in this matter. In the introduction of Auber's overture to 'Le Maçon' there is a holding G of 32 bars for the basses. It is, of course, quite impossible to play this with one bow ; the effect of a sustained note would be best obtained here by the players not all changing the bow at the same time.

68. Quite as common, and extremely effective, especially in *forte* passages, are the combinations of slurred and detached notes, as in the following:—

Ex. 7. MENDELSSOHN: 'Elijah.'

sf *sf*

Observe that in the first bar Mendelssohn has marked the *staccati* to prevent any misunderstanding; the pattern being once established, it was needless to mark the following bars fully. The chords of two and three notes in the third and fourth bars will be spoken of directly. In the following

Ex. 8. *Allegro.* AUBER: 'Le Philtre.'

ff

will be seen another example of the alternation of *legato* and *staccato* for the violin. It is impossible to illustrate all the various bowings; it will suffice to say that almost any phrasing is practicable, those that we have shown being among the most usual. Others will be seen in later examples.

69. In Ex. 7 of the last section are seen chords of two and three notes for the violin. It is clear that the sounding of two adjacent strings by the bow is quite easy; but it by no means follows that every combination of two notes is practicable. We must now show what are the limitations of the instrument in this respect.

70. The easiest combinations of two notes are those in which one at least of the two is played on an open string. The only limitation is, that it shall be possible to play the other note on the next adjacent string.

Ex. 9.
(*a*) G string open. (*b*) D string open.

(*c*) A string open. (*d*) E string open. (*e*)

In this example are shown some of the easiest passages of this kind. It will be seen that with the G string the lower note, and with the E string the upper, is always the open

string, while the second and third strings may be either the upper or lower of the chord. The double notes shown at (*e*) are impossible with E *as an open string*, because the lower notes, being all below A, can only be played on the third or fourth string, and it is impossible for the bow to miss the intervening string. We shall see directly that the last three of these combinations can be obtained in another way.

71. It will be observed that the three unisons, D, A, and E, are possible by playing these notes at the same time as open and stopped notes (§ 58). This is sometimes indicated by the composer when he wishes a forcible effect. At the commencement of the Prelude to 'Die Walküre,' Wagner has written the D on the second violins for 60 bars, expressly marking it 'Immer auf doppelten Saiten' ('always on doubled strings').

72. If both strings are stopped, instead of one being open, we get a much larger variety of combinations. All "double-stops" containing an interval of a major or minor third—provided the upper note is not below the open D of the third string—a perfect fourth or fifth, a major or minor sixth, a major, minor, or diminished seventh, are easy, provided they do not require any position higher than the third ; seconds and octaves are also tolerably easy, as likewise are augmented fourths and diminished fifths. All intervals larger than an octave should be avoided, *unless the lower note is an open string*. Except in very moderate *tempo*, successions of double notes should not be used in orchestral music, especially if they cannot all be played in the first position. If such an effect be required, it is better to divide the violins, of which there are always several in an orchestra, writing '*divisi*' over the part, the first player at each desk taking the upper notes, and the second the lower.

73. The two passages next to be given, taken from Mozart's Dance Music, will show the practical employment of the "double string" in the orchestra. The scores of both contain also parts for wind instruments, which it is not needful for our present purpose to quote.

Ex. 10. MOZART : 12 Minuetts, No. 4.

* See footnote to § 25.

Contrary to the usual practice, there are no violas in this score. To obtain four-part harmony for the strings, Mozart therefore makes more frequent use of the double-stop. It should be noticed that all the double notes are perfectly easy, as they can be played in the first position.

74. Our next example shows double stopping in *legato* passages.

MOZART : 6 Minuetts, No. 3.

Ex. 11.

Viol. 1°

Viol. 2do

Basso.

&c.

By referring to §58 the student will see that the fingering here is also quite easy.

75. In solo music freer use is made of double-stopping than would be advisable in writing for the orchestra. For instance, the following passage,

BEETHOVEN : Romance for Violin, Op. 40.

Ex. 12.

if intended for a number of violins, would be far too risky, it would be advisable in such a case to indicate '*divisi*' (§ 72).

76. Chords of three or four notes are also practicable on the violin under certain conditions. We saw just now that it was impossible to play together two notes both of which are below the open string, D. Similarly, three notes, all below the open A, and four below the open E, are unplayable for a similar reason. It would also be impossible to play such a chord as this—



The C and E must be played on the G and D strings in the first position; the upper note cannot be reached on the A string in the first position, and though it is quite easy to play it on the E string, the bow cannot leap over the A string. (Compare Ex. 9 (*e*) in §70.) The chord is therefore impossible, though it would become practicable by adding the C on the third space

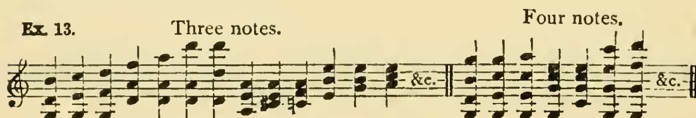
to be played on the A string. But even then, as we shall see directly (§ 80), it would not be advisable.

77. We now give another example of a chord which is impossible for a different reason.



Here all the notes can be played singly in the first position ; but, by referring to the table of fingering given in § 58, the student will see that both the highest and lowest notes of the chord have to be played with the second finger. Now while it is easy for the same finger to stop two *adjacent* strings (as in the middle notes of this very chord,) it is impossible for it to stop two strings which are not next to one another. A little practical knowledge of the violin will greatly assist the beginner in this matter ; for the sake of those who have not such knowledge, we give a few general principles.

78. I. Those chords are most sonorous and effective, as well as easiest to play, which contain at least one open string, and two such are even preferable to one. The following will serve as examples of good and effective chords in which this condition is fulfilled.



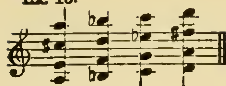
The student will find that all these chords can be played either in the first or third position.

79. II. If a chord of three notes is written containing no open string, it is best for each note to be at an interval of a fifth or sixth (possibly also a seventh) from the nearest note to it, as in the following :—



Let the student notice that at * the note A cannot be taken on the open string, and ask himself the reason.

80. III. The only chords of four notes without an open string which it is expedient to write are those which are the root positions of common chords, with the fifth next above the root, such as

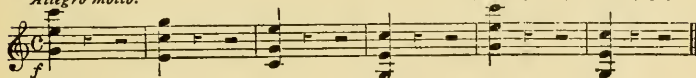


Chords of three and four notes can also be taken in arpeggio, as in the well-known cadenza of Mendelssohn's violin concerto.

81. IV. Chords of three or four notes are seldom effective, excepting in *forte* passages, and in these, they add less to the volume of tone than might be anticipated, as the bow has less force when drawn across three or four strings than when playing on a single one. It must also be remembered that, owing to the arched shape of the bridge, it is impossible to sustain more than two notes. The chords must therefore be played in arpeggio ; and if they are of longer value than crotchets, it is advisable (though not always done) to indicate whether two notes are to be sustained, or only one. Thus, not , but either or , according to the effect desired.

82. V. If a succession of chords, whether of three or four notes, be written, care must be taken to choose such as are easy, and sufficient rests allowed between them to give the player time to change his fingering. The two following examples from Beethoven illustrate this point.



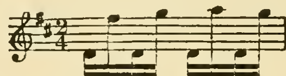


It will be noticed that in Ex. 17 the rule given in § 79 is carefully observed.

83. With the exception of such chords as those mentioned in §§ 76, 77, there are very few passages which are absolutely *impossible* on the violin. Chief among these are such as in rapid *tempo* contain many large skips, requiring the bow to leap over an intermediate string ; *e.g.* :—



Such a passage as this could not be played in an *allegro* or *presto* movement, though it would be possible in an *andante.* Evidently a *legato* here would be absolutely out of the question. If, however, the lower of the two notes were an open string—



the passage would be quite easy, as here all the upper notes could be played on the A string in the fifth position. The student should avoid writing passages which require many sudden and considerable changes of position, such as from the first to the fifth or sixth, as the relative position of the fingers on the strings is quite different, and accurate intonation becomes very difficult. The same objection does not apply to a sudden return *to* the first position, for here the player cannot easily go wrong.

84. The repetition of the same note at almost any degree of rapidity is perfectly easy on the violin. If a *tremolo* (the quickest possible repetition of a note) is desired, this is indicated by the sign or , according to the rapidity of the movement; it is often advisable also to add '*trem.*' to avoid mistake. The *tremolo* is possible in any degree of force, from *pp* to *ff*, as in the following passage :—

Ex. 18.
Andante. Schubert : 'Fierrabras.'

Viol. 1º
pp *cresc.* *ff* *p* *pp*

Viol. 2do
pp *cresc.* *ff* *p* *pp*

Viola.
pp *cresc.* *ff* *p* *pp*

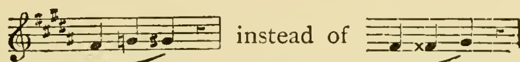
V'cello.
pp *cresc.* *ff* *p* *pp*

Basso.
pp *cresc.* *ff* *p* *pp*

(The notation of the viola will be explained later—§ 107.) The above extract illustrates a few practical points which the learner should bear in mind. Note first, that two instruments of the same kind (first and second violins,) have their staves

connected by a brace ; the same thing is done with the violoncello and contrabasso, when, as here, they have separate staves. If wind instruments of the same kind, *e.g.* horns or trombones, occupy more than one staff, these should also be braced together. The reason is, that the score thus becomes easier to read, and the braces serve, so to speak, as signposts, and prevent the student from mistaking the staff on which any particular instrument is written, especially if, as is often the case in manuscript scores, the clefs and key-signatures are omitted at the beginning of the lines. Observe, further, that the marks of expression should be added, as here, *for each instrument*, and not put once for all at the top or bottom of the score ; otherwise the copyist is almost certain to omit many of them, when writing out the separate orchestral parts.

85. At the fifth bar of the above passage it will be seen that Schubert has written for the viola and basses A♮, instead of the correct notation, B♭♭. In extreme keys, such irregularities are by no means uncommon. The composer often writes that note which is the easier to read at first sight, regardless of the true notation. A similar example may be found in the slow movement of Beethoven's piano concerto in E flat, where, in the seventh bar, he has written for the first violin



a procedure for which in this case there appears to be no sufficient justification.

86. A different kind of tremolo—the *legato tremolo*—is sometimes employed in modern music. This is produced by the rapid alternation of two notes of a chord on one instrument, while another plays the same notes, but in reversed order, so that both are heard continuously. The following passage, from the opening of the second act of 'Tristan und Isolde,' will make this quite clear :—

Ex. 19. *Sehr lebhaft.* WAGNER : 'Tristan und Isolde.'

Viol. 1º *ff* *dim.*

Viol. 2do *ff* *dim.*

Viola. *ff* *dim.*

V cello. *ff* *dim.*



Here, while the first violins are playing D♭, the second are playing B♭, and *vice versâ;* similarly, the violas and violoncellos are exchanging notes. The result is that all four notes are heard at once, but with quite a different effect from that produced in Ex. 18. In consequence of the rapid *tempo* (' sehr lebhaft' being the German equivalent of the Italian '*molto vivace*,') it is needless here to write '*trem.*'; the semiquavers are sufficient to produce the effect desired, which is frequently to be met with in Wagner's scores, and was probably invented by him.

87. Instead of producing the sound from the strings by drawing the bow across them, it is possible also to play the violin by plucking the strings with the finger, as with the harp or guitar. This effect is called '*pizzicato*'—an Italian word meaning 'pinched'—and is indicated in the score by the abbreviation *pizz.* The quality of the tone has then some resemblance to that of the harp, but the vibrations are less prolonged than on that instrument, and the sounds more detached. The effect should not be employed for the highest notes of the violin, being thin and unsatisfactory if written much above the staff. As violinists mostly play *pizzicato* with only one finger, very rapid passages are impossible in this way; the student should not write anything quicker than quavers in an *allegro.* When the usual method of playing is to be resumed, this is shown by the words '*coll' arco*' ('with the bow'), or more usually only *arco.*

88. The following example of a *pizzicato* passage (*see* Ex. 20, next page), illustrates two points not yet noticed —the crossing of the second violin over the first, which is by no means infrequent, and the unison of the viola and violoncello, strengthening the bass of the three-part harmony.

89. Pizzicato harmony for all the strings is often employed to imitate the effect of a harp, as in the following passage,

Ex. 20.
Moderato.
BENNETT: Overture, 'Die Naiaden.'

Viol. 1º, Viol. 2do, Viola, V'cello. pizz. *p* *ff*

which is the opening symphony of Alfred's solo, "I am a harper, sad and worn."

Ex. 21.
Andante moderato.
E. PROUT: 'Alfred.'

Viol. 1º, Viol. 2do, Viola, Bassi. pizz. *p*

90. Our next illustration shows the use of the pizzicato for a part only of the strings, the others playing with the bow—

Ex. 22.
Adagio.
HAYDN: Symphony in C ('Il Distratto').

Viol. 1º SOLO. *mf*; Viol. 2do *p*; Viola *div.* *p* pizz.; Bassi *p* pizz.

We see here the melody played by a *single* violin, solo, while the other parts are played by all the strings; we have further

an example in the viola part of the '*divisi*' spoken of in § 75. Notice, too, the contrasted rhythms of the different parts.

91. There is yet another method of playing the violin and the other stringed instruments, which, though very seldom employed, and only for special effects, must be mentioned here. Instead of drawing the hair of the bow across the strings, they are struck with the wood, the bow being turned round; the resulting sound is very short, and rather weak. One of the earliest examples of this effect is seen in the accompaniment of the solo "Je vous attends dans l'ombre de la nuit," in Boieldieu's 'Le Calife de Bagdad.' We give the first bars of the opening symphony:

Ex. 23.
Moderato. BOIELDIEU: 'Le Calife de Bagdad.'
Staccato avec le dos de l'archet.
Viol. 1°
Viol. 2do
Viola.
fp Staccato avec le dos de l'archet. *fp*
Bassi.

This effect, which Wagner has used with chords in 'Die Meistersinger'* and 'Siegfried,' is generally indicated, not (as above,) by "with the back of the bow," but by the Italian "*col legno*" ('with the wood'). The occasions for its appropriate introduction are extremely rare.

92. The *mute* (*Italian* sordino, *French* sourdine, *German* Dämpfer,) is a little clamp with notches, in shape resembling a comb, and generally made of brass, placed on the bridge, which it holds tightly, and thus prevents its imparting its vibrations to the soundboard. The result is not only a diminution in the power of the instrument, but a very marked change in the quality of tone, which becomes thin, veiled, and mysterious.† Its employment is indicated by the words '*con sordini*,' (or *con sord.*) and in German scores often by 'mit Dämpfer'; and it must be remembered that if the mutes are to be put on the instruments in the course of a movement, sufficient rests must be allowed for this to be done. About three or four bars in an *allegro* will be enough. To

* See within, Ex. 203.

† It should be noticed that the mutes produce less difference in the tone of the strings *pizzicato* than when the bow is employed.

remove the mutes (marked '*senza sord.*' or 'ohne Dämpfer') a shorter rest—one to two bars—will suffice.

93. One of the earliest examples of the use of the mutes is the following:

Ex. 24. *Larghetto.* HANDEL: 'Alexander Balus.'

Viol. 1º con sord. Viol. 2do con sord. Viola con sord. V'cello. &c.

Here the three upper parts are *con sordini* while the violoncellos are without them. More frequently they are applied to the whole of the strings except the double-basses, as in our next example:

Ex. 25. *Allegro moderato.* HÉROLD: 'Le Pré aux Clercs.'

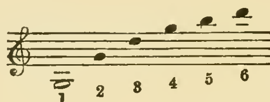
Viol. 1º con sordini. *pp* Viol. 2do con sordini. *pp* Viola con sordini. *pp* V'cello. *pp* con sordini. &c.

Further illustrations of the employment of *sordini* will be found later in this volume.

94. HARMONICS (*Fr.* Sons harmoniques), are overtones produced by the vibration of a string in segments, instead of throughout its whole length. It is a well-known fact of acoustic science that such overtones are produced together with the fundamental tone (that is, the tone produced by the entire string), and that the quality of the sound depends upon the greater or less strength of these overtones, or "upper partials," in the compound tone.* When a string vibrates

* For a full explanation of this subject the student is referred to Chapter IV. of Sedley Taylor's 'Sound and Music' (Macmillan & Co.).

in halves, the sound produced is the octave above the fundamental tone; when in thirds, the twelfth above, and so on. The only upper partials which have any practical bearing on the subject we are now treating are the first six notes of the harmonic series. On the fourth string of the violin they are the following :—



The figures under each note show the number of segments into which the string divides to produce each of the notes here given. Thus the G above the staff results from the string vibrating in fourths, the B in fifths, and the upper D in sixths. The other strings of course produce overtones bearing *the same relation* to their fundamental tones as those on the G string.

95. We have just said that these overtones are produced with more or less strength together with their fundamental tone. But it is possible to obtain them *without* the fundamental tone by lightly touching the string with the finger on one of the "nodes," that is, one of the points at which the string breaks up into segments. If it be thus touched exactly in the middle, it will vibrate in halves, if at one-third from either end, in thirds, and so on. When touched in the middle, or at one-third, one-fourth, &c., from the bridge—*not from the nut*—the *pitch* of the resulting note is the same as if pressed down, though the quality is different, as we shall see directly. But at any other points on the string, it makes a great difference whether it be pressed against the finger-board or merely lightly touched with the finger. For instance, if we press down the G string at a distance of one-third from the nut, we leave two-thirds free to vibrate, and as the ratio of 2 : 3 gives the perfect fifth, the notes produced will be the D below the staff—the fifth above open G. But if we only *touch* the string at the same point, it breaks up into thirds, each segment of the string producing the third upper-partial, that is, the D on the fourth line of the staff. If we touch the string at a point one-third from the bridge, instead of one-third from the nut, we get the same result.

96. After the explanation just given of the production of the third upper-partial, it will be sufficient to say that the fourth, fifth and sixth can be similarly obtained by touching the strings on the point which, if pressed down, would give respectively the perfect fourth, major third, and minor third above the open string. The student who understands the last paragraph will easily verify this for himself.

97. In consequence of their peculiarly clear, almost flute-like quality of tone, these harmonics are called in Germany "Flageolet-töne," and their employment is often indicated in German scores merely by the word 'Flageolet.' More than one method is in vogue for the notation of harmonics. Some composers merely put an o over the note to be sounded, leaving the player to think how he is to produce it. In the case of the octave of the open strings this indication is quite sufficient, and these notes, accordingly, are generally written thus :—



Here there is no difficulty, as the finger touches the same place on the strings as it would were the notes pressed. But with the remaining harmonics, it is better to indicate the point at which the string is to be touched. This is usually done by writing a black head for the open string, and a diamond-shaped head for the note to be touched, while the actual sound heard is written as a small note above. The following table



gives all the harmonics that can be thus obtained. The higher ones, especially on the E and A strings, are so difficult to produce that they are rarely, if ever used in orchestral music ; the only ones that are at all frequently to be found are the four octaves of the open strings.*

98. Raff, in the Scherzo of his third symphony ('Im Walde') has employed a somewhat different notation for the harmonics. He does not mark the open string, but indicates the fact that the notes are to be played as harmonics by putting a diamond-shaped head for the sound to be heard, while the ordinary minim heads show where the strings are to be touched.

* The following table may be of assistance to the student in remembering these harmonics :—

A touched 8ve sounds its unison.
,, perfect 5th ,, 8ve
,, perfect 4th ,, 12th.
,, major 3rd ,, 15th. (double 8ve)
,, minor 3rd ,, 17th. (major 3rd above the double 8ve)

These intervals are in all cases reckoned from *the note touched*—not from the open string.



If the student has clearly understood our previous explanations, he will see by referring to Ex. 26 that the first two of these harmonics are obtained on the A string and the third and fourth on the E string.

99. In addition to the harmonics already described another variety, known as "artificial harmonics," is not infrequently met with in violin solos, though they are, because of their greater difficulty, seldom used in orchestral music. The law according to which these are formed is exactly the same as that regulating the other (natural) harmonics. Just as the latter are obtained by touching one of the nodes of the whole string, the artificial harmonics are made by touching one of the nodes of the shortened string. For this purpose we employ two fingers of the left hand. The first finger presses the string firmly down in the usual way while one of the other fingers (generally the fourth) touches the string higher up. An example will make this perfectly clear.

100. By referring to the foot-note to §97, it will be seen that a touched fourth gives its twelfth, and a touched major third gives its double octave. Now suppose on the G string the A is pressed down with the first finger (1st position), the portion of the string between the finger and the nut cannot vibrate—in other words, the string is shortened (§ 58). Now if the D (the perfect fourth above A) is touched by the fourth finger the whole vibrating part of the string will break up into fourths, and the A on the first leger line above the staff will be sounded. If C♯ be touched instead, with the third finger, the C♯ two octaves above will be heard. By far the oftenest used of these artificial harmonics are those with the touched fourth, as being the easiest to produce. A moment's thought will show the student that it is possible in this way to play an entire scale in harmonics, thus :—



The notation mostly used for these artificial harmonics is that described in §97, and shown in the above example. Sometimes, however, the player is left to find out for himself how the notes are to be produced, as in the passage for four solo violins at the beginning of the prelude to 'Lohengrin' :—



Here Wagner merely writes over the parts 'Durch Flageolet hervorzubringen' ('to produce by harmonics'). Let the student think for himself how these are to be obtained ; we will merely say for his guidance that only one of the four is *necessarily* an artificial harmonic.

101. In modern violin solos entire passages are sometimes written to be played as harmonics. A very good example is to be seen in the slow movement of Saint-Saëns' violin concerto in B minor.

Ex. 30. C. SAINT-SAËNS : 3rd Violin Concerto, Op. 61.

Andantino quasi Allegretto.

Oboe 1º

Clarinetto 1º * in B♭

Violino *Solo.*

8va

divisi.

Violino 1º

Violino 2do

Viola.

V'cello e Basso.

pp

* The part of the clarinet sounds one tone lower than written. See Chap. VIII., § 295.

A particularly charming effect is obtained here by the doubling of the arpeggios for the clarinet by the crystalline tones of the violin harmonics two octaves higher. We quote only the commencement of the passage, which is twelve bars in length. It affords an excellent illustration of contrasts of tone colour, a subject which we shall treat in a later part of this work. It will be seen that here, as in Ex. 29, no indication is given as to the manner of obtaining the harmonics. It should be added that such a passage would be quite impracticable on the orchestra, being too difficult for any but very finished artists.

102. It was said in the last chapter (§ 25,) that the violins in the orchestra were mostly divided into two parts. This division is adopted in an enormous majority of cases. Sometimes, however, a larger number of parts is employed. This is more common in modern than in older music, though in the scores of Handel we not infrequently meet with three, and occasionally (as in the overture to 'Athalia') even with four violin parts. Neither Haydn, Mozart, nor Beethoven ever (so far as we are aware) writes more than two violin parts for the orchestra, though Haydn, as we shall see presently, sometimes writes parts for *solo* strings in addition to the ordinary parts for the *tutti*. An excellent example of the division of the violins into four parts—probably also

the earliest in modern music—is seen in Weber's overture to 'Euryanthe':—

Ex. 31. WEBER: 'Euryanthe.'

Largo.

8 Violini Soli, con sordini.

This passage is marked in the score to be played by eight violins, that is, by two to each part. Let the student notice the effect of the *sordini*, and also the careful way in which the "double-stops" are written so as to offer no difficulty to the performer.

103. A different kind of division is that referred to above, in which there are independent parts for solo strings, as in the following very effective combination by Haydn:—

Ex. 32. HAYDN: Symphony in D, No. 43.

Adagio.

Viol. 1º *Solo.*
Viol. 2do *Solo.*
V'cello *Solo.*
Viol. 1º *Tutti.*
Viol. 2do *Tutti.*
Viola.
Bassi.

Though there is really only four-part harmony here, the passage is interesting as showing the combination of the *arco* of the solo strings with the *pizzicato* of the others. The employment of two violins and one violoncello as solo instruments seems to be a survival of the 'Concerto Grosso' of Handel and Corelli, in which the same combination plays an important part.

104. At the fifth bar of the first solo violin will be seen a sign which we have not yet met with, and which is now seldom if ever used. The waved line under the notes indicates the *vibrato*—a slight variation in the pitch of the note, pro-

duced by making the finger tremble upon the string. When used with moderation it is very effective in expressive melodies; but (as with the *tremolo* of vocalists,) its too frequent employment becomes a most objectionable mannerism, not to say nuisance. It is sometimes called the "close shake," and its employment is mostly left to the discretion of the player.

105. Besides the comparatively common division of the first and second violins into two parts each, more elaborate subdivisions are sometimes found in modern scores, especially in the later works of Wagner. In the final scene of 'Das Rheingold' (p. 287 of the full score,) there are twelve violin parts, besides six for violas and four for violoncellos, making 22 string parts in all. We have not room to quote the passage, which consists only of arpeggios of the common chord, crossing and interlacing in all positions. Elaboration of this kind greatly increases the difficulty of performance, and we strongly advise the student to abstain from such complexities; the occasions are, in fact, rare when it is expedient to divide the violins at all. It must not be forgotten that doing so weakens the tone of each part, and may easily destroy the balance of the orchestra unless very judiciously managed.

106. Though there is comparatively little difference, as regards facility of execution, in the different keys for the violin, it must be remembered that some keys are much more sonorous and brilliant than others. The best are those which allow the use of open strings. For this reason D flat, though not difficult, is much less bright in its effect than D natural. In the latter key, the open strings, when not played upon, will by "sympathetic resonance"* sound as harmonics many of the notes played upon the other strings, thus reinforcing and giving brilliancy to the tone of the instrument. This is why sharp keys are on the violin in general brighter than flat keys; we speak, of course, of those with more than two or three sharps or flats.

THE VIOLA.

107. The VIOLA (*Fr.* Alto, *Ger.* Bratsche†) may be regarded as the alto of the violin, bearing to it approximately the same relation which the contralto voice does to the soprano. As the student will have discovered from the examples already given, music for the viola is written in the alto clef; but, to avoid the use of too many leger lines, the G clef is employed for its upper notes.

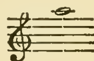
* See Sedley Taylor's 'Sound and Music,' Chap. III.

† This word is a corruption of the Italian *Braccio*, the arm. The instrument was formerly called 'Viola da Braccio' (*i.e.* a viol held on the arm), as distinguished from 'Viola da Gamba' (a viol held between the legs), the predecessor of the modern violoncello.

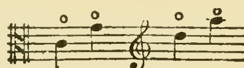
108. The four strings of the viola are tuned a perfect fifth lower than those of the violin—



All that was said as to the fingering of the violin (§§58, 59,) applies equally to the viola ; but the positions higher than the fifth are hardly ever employed in orchestral music, as the notes above



are far more effective, as well as easier, on the violin. The same varieties of bowing are also possible as on that instrument, and the *tremolo*, *pizzicato*, and *sordini* are used in exactly the same way. With regard to double-stops and chords, all that are effective and practicable for the violin are equally good for the viola, *if transposed a fifth lower.* Harmonics, whether natural or artificial, can also be produced exactly in the same way as on the violin, though, as will be seen directly, with less freedom ; but, excepting the octaves of the four open strings,



they are seldom employed in orchestral music. An example of their use may, however, be seen in the second act of Wagner's ' Siegfried ' (p. 269 of the full score).

109. There is considerable difference between the quality of tone of the violin and viola—a difference easily to be understood, if the relative sizes of the two instruments be taken into account. As the compass of the viola is a fifth lower than that of the violin, it would, if constructed in the same proportions, have strings half as long again as the smaller instrument. As a matter of fact, though the size of individual violas varies slightly, the strings are on an average not more than about one-tenth longer than those of the violin, and, in order to deepen their tone sufficiently, they are made thicker in proportion to their length—exactly as is done with the bass strings of a pianoforte. This alteration in the relation of thickness to length materially modifies the tone of the viola, which, while rich and penetrating, is wanting in the brilliancy of the violin, especially on the upper strings. It is most probably for the same reason that the harmonics are less free in their produc-

tion on the viola, and therefore more sparingly used, and also that very rapid passages are more difficult and less effective than on the violin.

110. The most frequent use of the viola is as the third part of the "quartett" (§25), that is, below the second violins, and above the bass. It should be mentioned here that it is much more common for the violas to cross above the second violins than for the middle parts (alto and tenor,) to cross in vocal writing. The student will find an instance of this in Ex. 24. But the viola is not always relegated to such a subordinate position. Owing to its expressive quality of tone, it is occasionally entrusted with the leading part of the quartett. Mendelssohn has done this with great effect in the air "Lord God of Abraham" in 'Elijah,' in which the violas are written above the violins almost throughout. We give a short extract :—

Ex. 33. *Adagio.* MENDELSSOHN : 'Elijah.'

Viol. 1°

Viol. 2^do^

Viola.

ELIJAH.

Lord God of A - bra-ham, I - saac, and Is - ra - el, this

V'cello e Basso.

day let it be known that Thou art God— and

Vc.

C.B.

&c.

(We have omitted a few notes for the clarinets in the third and fourth bars.) Of the division of the violoncello and double-bass in the last bar we shall speak in the next chapter.

111. Owing to the telling and penetrating quality of tone of the violas, it is not necessary that they should be as numerous in the orchestra as either the first or second violins. They are usually about one-third in number of the whole mass of violins, so that a well-balanced orchestra that contained eight first and eight second violins should have five or six violas. Even with this smaller number, we often find them divided, either throughout a whole movement, or for a single passage, into firsts and seconds. An instructive example of this is the following :—

Ex. 34. *Andante.* MOZART : Litany in B flat.

Viol. 1º. Viol. 2do. Viola. Voce. Bassi.

Dul - cis - - - sim - um con - vi - vi - um cui as - sist - unt, as - sist-unt an - ge - li, an - - - - - &c.

(A few holding notes for the wind have been omitted.) Here the passage given first by the violins is repeated *at the*

same pitch by the divided violas. In the fifth and sixth bars the violas double the violins in the octave above—a very unusual disposition of parts. Notice also the beautiful effect of the contrasted bowings—two groups of semiquavers *legato* followed by one *staccato*.

112. Our next example of a melody given to the violas is of a different kind.

Ex. 35.
Moderato. GLUCK: 'Alceste.'

Viol. 1, 2, *unis.* pizz. *p*
Viola 1, 2. *p*
ALCESTE.
Bassi. pizz. *p*

Vis pour gar - der...... le sou-ve - nir.... D'une é - pou - se qui te fut chè-re, Qui ne vi - vait que pour te plai - - - re, Et qui pour toi vou - lut mou - rir.

In this charming passage the divided violas are accompanied by the other strings *pizzicato*, the violins being in unison except at the first note in the tenth bar. Note that the colouring would have been quite different had the two viola parts been given to the violins and the *pizzicato* to the violas. Observe also the notation of the violas in bars 8 to 10. The two lower notes having the same stem shows that it is the *second* violas (not the firsts,) which have the double-stops, the upper note being an open string throughout.

113. Sometimes for a quiet effect the basses of the orchestra are silent, the lowest part of the harmony being given to the violas, as at the beginning of Agatha's great *scena* in 'Der Freischütz,' known in England as "Softly sighs." One of the earliest, as well as one of the most beautiful examples of this will be found in Handel's air "Hide me from day's garish eye," of which we give the first eight bars.

Ex. 36. *Largo.* HANDEL: 'L'Allegro.'

Viol. 1. *pp*
Viol. 2. *pp*
Viola. *pp*
VOCE. Hide me.... from day's gar - ish eye,

While the bee with ho - - nied thigh, Which &c.

Excepting for one short interlude of four bars, the basses are silent (the harmony being in three parts only,) until the fiftieth bar, when they enter with beautiful effect at the words "Then, as I wake, sweet music breathe." The whole song is a charming specimen of simple and delicate orchestration.

114. Three-part harmony for the strings — the violas

playing in unison (or octaves,) with the basses—is frequently found in the older scores, such as those of Gluck and Cimarosa. It may also be seen in the earlier works of Haydn and Mozart, but it is very seldom met with in more modern music (see Exs. 20 and 32 above.)

115. When a sombre tone is required, the violins are sometimes suppressed altogether, and their place is taken by violas. In his opera 'Uthal,' Méhul has done this throughout, but the effect soon becomes monotonous. But incidentally, and even for entire single movements, the procedure may be adopted with advantage. Familiar examples are Sarastro's air "O Isis und Osiris" in the second act of 'Die Zauberflöte,' and the movement in $\frac{3}{2}$ time in the finale of Beethoven's ninth symphony. We give a less known, but not less beautiful or effective passage by Schubert.

Ex. 37. Schubert: 'Gesang der Geister über den Wassern.'

Adagio molto.

Viola 1°.

Viola 2do.

V'cello 1°.

V'cello 2do.

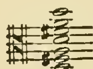
Contrabasso.

The student must not forget in this and the preceding quotations that the part of the double-bass sounds an octave lower than it appears on paper.

116. In orchestral music the viola is but seldom used as a solo instrument. Examples of its employment in this way may be seen in Aennchen's song in the third act of 'Der Freischütz,' and in Berlioz's 'Harold' symphony, which latter contains an important part for solo viola throughout. Mozart has written a double concerto for violin and viola. The key of the work is E flat, and it is interesting to notice that, to increase the brilliancy of the viola, Mozart has directed that the strings are to be tuned a semitone up, and has written the part in D, with the signature of two sharps. If the student will remember what was said in § 106, he will see that this change makes the viola part much brighter, and better able to hold its own against the naturally superior brilliancy of the violin.

117. We mentioned in § 109 that the viola was constructed on different proportions from the violin. With a view to improve the tone, a German musician, Hermann Ritter, invented about twenty years ago a new kind of viola, to which he gave the name of the Viola Alta. In this instrument the proportions are the same as on the violin, but it is half as large again. It is obvious that this increases correspondingly the distances between the notes on the string, and requires a so much greater stretch in the player's fingers that performers with small hands are altogether unable to manage the instrument. It is probably for this reason chiefly that it has not yet found much acceptance, for the quality of its tone is much richer and fuller than that of the ordinary viola.

118. The Viola d'Amore is an instrument which is now almost obsolete, and which is only mentioned here because Meyerbeer, in the first act of 'Les Huguenots,' has written an important solo for it. It had seven catgut strings tuned in thirds and fourths, so as to give the chord of D major:—



Beneath the finger-board, and passing under the bridge, were seven other strings, of wire, called "sympathetic strings," because they were tuned in unison with the catgut strings, and vibrated with them in "sympathetic resonance" (§ 106). This gave a peculiarly sweet and mysterious quality to the tone. The solo part in 'Les Huguenots' mentioned above is now generally played on the ordinary viola.

CHAPTER IV.

STRINGED INSTRUMENTS; THE VIOLONCELLO AND CONTRABASSO.

119. The Violoncello (*Fr.* Violoncelle), the name of which is often abbreviated into 'Cello' (plural 'Celli'), is by no means the least important of the group of stringed instruments with which we are now dealing. Not only does it in most places sustain the bass of the harmony, in which case it is generally doubled in the lower octave by the double-bass, but it is very often used as a melodic instrument, especially by modern composers, and (as will be seen in some of the examples to be given later,) is sometimes written above all the other strings.



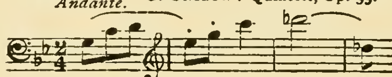
THE VIOLONCELLO.

120. The violoncello has four strings, tuned an octave below those of the viola, and music for it, except in the upper part of its compass, is written in the F clef.



As the instrument has a very extensive compass upwards, the tenor clef, [tenor clef], and even the G clef [G clef], are used for its higher notes. The modern practice is to employ mostly the tenor clef, and to restrict the use of the G clef to extremely high passages. But the student should be told that formerly it was the custom to write the G and F clefs only, and in that case the notes for the former were written an octave higher

than they really sound. The following example will make this clear :—

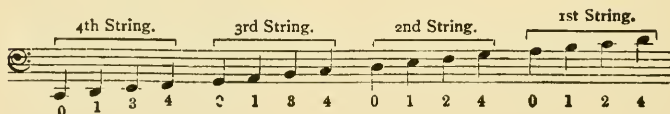


Here the leap of a minor ninth at the beginning of the second bar would be an obvious absurdity. The real effect is,

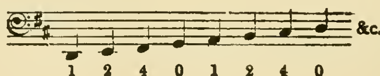


and a modern composer would write it in this way, unless he preferred to use the G clef, in which case he would write the notes an octave lower than they appear in Onslow's score.

121. Owing to the much greater length of the strings, the fingering of the violoncello differs materially from that of the violin and viola ; the distance between one finger and the next, in the natural position of the hand, is not, except in the higher "shifts," more than a semitone, instead of a tone. We give the fingering for the scale of C major in the first position.

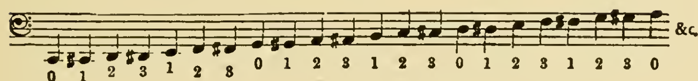


In general the interval of a tone is taken, as here, between the first and third, or second and fourth fingers ; but it is in some cases needful to modify this fingering, as, for instance, with the scale of D major :—



122. Chromatic scales are easier on the violoncello than

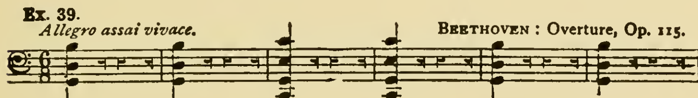
on the violin, because there is a different finger for each semitone. The fingering is in all cases very simple :—



It will be seen that two positions are used on each string.

123. As with the violin and viola, the compass of the violoncello can be considerably extended upwards by "shifting" (§ 59). Seven positions are in use, each being (as on the violin) one note higher than the preceding. In the seventh position the note is reached on the first string. But a higher compass still is obtainable with what are called the "thumb positions," in which the thumb of the left hand is placed on the string, the fingers being thus enabled to reach higher notes than in the ordinary positions. As we are not writing a series of instruction books for orchestral instruments, we cannot go into all the details of the fingering, for which the student should refer to some violoncello tutor ; we confine ourselves to a few general principles.

124. Double notes and chords are less frequently written for the violoncello than for the smaller stringed instruments. If one or two of the notes are open strings, such chords will in general be easy. If there are no open strings, the best intervals to write are fifths, sixths, and minor (not *major*) sevenths, and, of combinations of three notes, only common chords containing intervals of a fifth and sixth. But by far the most effective and easiest chords are such as contain open strings ; *e.g.*



In Ex. 23 of the last chapter will be seen the double string for the violoncello. The composer might have indicated his intentions more clearly ; the double-bass, as we shall see later in this chapter, will here play only the lower note, D, while the violoncello plays on the two open strings.

125. Such chords as those shown in our last example can also be effectively employed in arpeggio, as in the great duet in the second act of 'Euryanthe,' of which we quote the first four bars.

Ex. 40.

Allegro animato. WEBER. 'Euryanthe.'

Viol. 1°
Viol. 2do
Viola.
EURYANTHE. Hin nimm die See - - le mein,
ADOLAR. Hin nimm die See - - le mein,
V'cello.
Basso.

Ath - - - me mein Le - - - ben ein,
Ath - - - me mein Le - - - ben ein,

Another good instance of the employment of arpeggios for the violoncello will be seen in the trio of the minuetto of Beethoven's eighth symphony.

126. All that was said in the last chapter as to bowing

and phrasing, the *tremolo*, *pizzicato*, and *sordini* on the violin holds good also of the violoncello. The *pizzicato* is especially effective on the latter instrument, as the longer strings have more resonance when twitched with the finger than those of the violin. This greater length of string also renders the pizzicato on the higher notes more effective than is the case with the violin (§ 87).

127. An interesting and instructive example of the *pizzicato* for the violoncello is the following : —

Ex. 41.
Allegro. HÉROLD : 'Le Pré aux Clercs.'

Flauto e Piccolo.
Viol. 2do.
Viola.
V'cello.
C. Basso e Timpani.
pizz.
p

The upper staff of this score is played both by the flute and piccolo. The student will learn later (§ 216) that the latter instrument sounds an octave higher than written. The 'Timpani' on the lowest staff are the kettle-drums (§ 37); these give the notes as written, while the double-basses sound them an octave lower. We see here the violoncelli *pizzicato*,

while the double-basses continue to play with the bow; we must note also the successive employment of the three clefs (§ 120), the notes in the G clef being written at their real pitch. Observe, too, that the pizzicato is rendered more prominent by doubling the violoncello by the viola, and that as the passage ascends, and these instruments reach their higher register, where the tone is thinner, the second violin is added, to strengthen the middle part.

128. Harmonics are both practicable and effective on the violoncello, and are produced (whether natural or artificial) in precisely the same way as on the violin. Their employment, excepting in solos, is extremely rare, and need not detain us now.

129. The primary function of the violoncello in the orchestra is, as already said (§ 119), to form the bass of the stringed instruments. It is used in this way in the large majority of the passages we have already quoted, and is then generally doubled by the contrabasso in the lower octave. Often, however, in quiet passages especially, the bass of the harmony is given to the celli alone. We have seen instances of this in Exs. 24, 25, and refer students to a very familiar and excellent illustration of the same point in the beginning of the adagio of Beethoven's ninth symphony. Sometimes the bass is given to the double-basses alone, while the celli give an additional middle part to the harmony, as in the last bars of Ex. 18. At other times the violoncello and viola, so to speak, exchange places, the former taking the tenor part of the harmony, while the latter doubles the contrabasso. When this is done, it will generally be to bring into prominence some expressive counterpoint, as in the following passage:—

Ex. 42. *Allegretto.* H. Goetz: Symphony in F, Op. 9.

Viol. 1º p

Viol. 2do p

Viola. p

V'cello. p

Basso. pp

Here the melody allotted to the cello in its upper register would be infinitely less effective on the lower strings of the viola. Observe also that here the viola doubles the contrabasso in the unison, instead of, as usual, in the upper octave.

130. As a melodic instrument, the violoncello is one of the most important in the orchestra. There is a beautiful and expressive quality in its upper register that nothing else can replace. Its lower notes can also be very effectively employed for melodies of a sombre character, as, for instance, in the long solo for the celli, unaccompanied save by a *pianissimo* roll on the kettle-drum, at the commencement of the second act of 'Lohengrin.' But it is more frequently used in the middle or upper part of the orchestra. We give some characteristic examples.

Ex. 43.
Allegro non troppo. BRAHMS: 2nd Symphony.

Viol. 1°
Viol. 2do
Viola. cantando.
V'cello. cantando.
Basso. pizz.
p

131. In this beautiful passage the melody of the celli is doubled, mostly in the third below, by the violas, while the violins give broken chords above, and an effective bass is supplied by the pulsations of the double-bass *pizzicato.* Notice that the effect of the passage would be entirely ruined if the viola and cello exchanged parts, because the latter is much more powerful than the former.

132. In our next example

Ex. 44. Meyerbeer: 'Robert le Diable.'

we see a very light accompaniment to the melody. The violas here double the contrabassi in the octave, and, on the note A, in the double octave, as the lower A is not on the viola. The chords printed in small notes on the lowest staff

and marked 'Fagotti,' are parts for bassoons. We have already said (§ 42, *note*) that in modern French scores four bassoons were sometimes used ; here we see three.

133. The passage next to be given is instructive.

Ex. 45.
Larghetto.
RAFF : 1st Symphony.

Viol. 1°
Viol. 2do
Viola.
V'celli 1, 2.
vibrato.
smorz.
&c.

Here the composer wants a very quiet bass. The double-bass would be too heavy, and the viola does not go low enough ; he therefore divides the celli into firsts and seconds, the former having the melody in the upper part, while the latter takes the bass. As only half the celli have the melody, the accompaniment is naturally kept very light.

134. When used as a melodic instrument, the violoncello is sometimes doubled in the unison by other instruments. Of these the viola is most frequently used, as in the familiar passages of the Andante of Beethoven's Symphony in C minor, which are too well known to need quotation. Another

example of the same combination will be seen in the opening of Dvořák's second symphony. Sometimes, as we shall see in a later chapter, the celli are doubled by the bassoons. Our next example shows a rarer combination—the unison of the celli and the first violins

Ex. 46. *Adagio.* AUBER: 'Marco Spada.'

Viol. 1º. *p* &c.
Viol. 2do. *p* &c.
Viola. *p* &c.
V'cello. *p* &c.
Basso. *p*

We give only the string parts. To complete the score, two bassoons double the second violin and viola (of course with *holding* notes), and two horns in unison, also with holding notes, play the octave above the double-bass. The peculiar effect here results from the combination of the upper register of the cello with the lower register of the first violins, which would probably play the whole passage on the G string.

135. In the following extract from Schubert's great symphony in C,

Ex. 47. *Andante.* SCHUBERT: Symphony in C, No. 7.

Viol. 1, 2. pizz. *unis.*
Viola. *div.* *p*
V'cello. *div.* *p*
Basso. pizz. *p*



is seen in the first two bars an instance of the doubling of the celli by the violas, spoken of in the last paragraph, as also of the division of both. In the third bar the violas are written below the celli (compare Ex. 43). The *pizzicato* of the other strings allows the middle harmonies to be heard with special clearness.

136. We sometimes find the violoncellos divided into more than two parts. One of the first composers to do this was Cherubini. In the first act of his 'Faniska,' the opening of the soprano scena is accompanied by three violoncellos. A more curious example is to be seen in the introduction of his 'Chant sur la mort de Joseph Haydn,' where, to obtain a sombre and funereal tone-colour, he divides the celli into four parts, all muted :—

Ex. 48. CHERUBINI : 'Chant sur la mort de Joseph Haydn.'

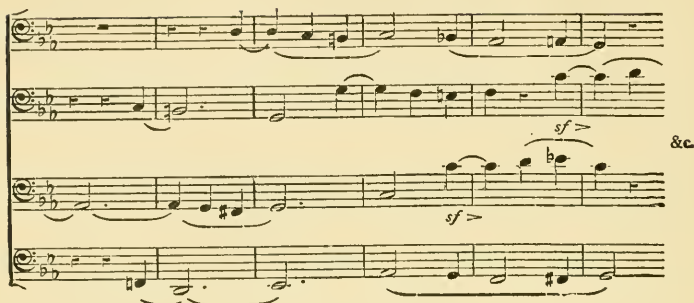
Lento. con sordini.

V'cello 1°. *pp*

V'cello 2°. con sordini.

V'cello 3°. con sordini.

V'cello 4°. con sordini. *pp*



137. Every one is familiar with the opening of Rossini's overture to 'Guillaume Tell,' which is scored for five *solo* violoncellos. Wagner has also divided his celli into five parts in the first act of 'Die Walküre.' As a contrast to our last example, we give a beautiful passage from 'Siegfried,' in which there are four parts for celli :—

Ex. 49. *Mässig* (= *Moderato*). WAGNER : 'Siegfried.'

Viol. 2. — pizz. *p*

Viola. — *div.* pizz. *p*

Mime. — Mein Kind, das

V'celli 1, 2. — *p* *cres - - - - - - cen - - - - - - do.*

V'celli 3, 4. — *p cres - - - - - - cen - - - - - - do.*

Bassi. — pizz. *div*

lehrt dich ken-nen wie lieb ich am Her-zen dir lieg'.

più p *più p*

As the violas are divided here, Wagner, with careful regard for the balance of tone in the chords, has directed that only half the second violins are to play. The division of the double-bass is, as will be seen later, somewhat unusual.

138. A single violoncello is sometimes employed in the orchestra, especially in vocal music. In this case, the other celli mostly play with the basses. A well-known example will be seen in the air "Be thou faithful unto death," in Mendelssohn's 'St. Paul.' We give a short incidental solo passage as our illustration.

Ex. 50. BEETHOVEN: 'Christus am Oelberge.' ('Mount of Olives.')

Adagio molto.

Corni in E♭ (sounding a major 6th lower).

Viol. 1º

Viol. 2do

Viola.

V'cello *Solo.*

Bassi.

The notation of the horns will be fully explained in a later chapter. Here they simply sound the dominant of the key. Our extract is quoted from Breitkopf and Härtel's complete edition of Beethoven's works ; in the original edition of the oratorio, published early in the present century, the cello solo is printed, according to the notation referred to in §120, thus :—

&c.

139. Schumann, in the slow movement of his pianoforte quartett, has at the end, for the sake of a long tonic pedal, directed the violoncello to tune the C string down to B flat, and he sustains the octave for thirteen bars. This is quite an exceptional case, and is not recommended for imitation.

THE DOUBLE-BASS (CONTRABASSO).

140. The Double-Bass, or Contrabass (*Fr.* Contrebasse, *Ital.* Contrabasso,) is the largest in size, and deepest in pitch, of all the stringed instruments. To it is allotted in general the duty of doubling in the lower octave the bass of the harmony played by the violoncello. As in many cases the performer plays from the violoncello part, music for the double-bass is written an octave higher than the actual sounds produced. We here meet for the first time with a "transposing instrument"—*i.e.*, one in which the notes in the score differ from those actually heard.

141. Two kinds of double-bass are in use in this country, one with three strings, and one with four. More than one system of tuning is adopted for both instruments. The most usual is, to tune the strings by fourths. With the three-stringed bass this gives

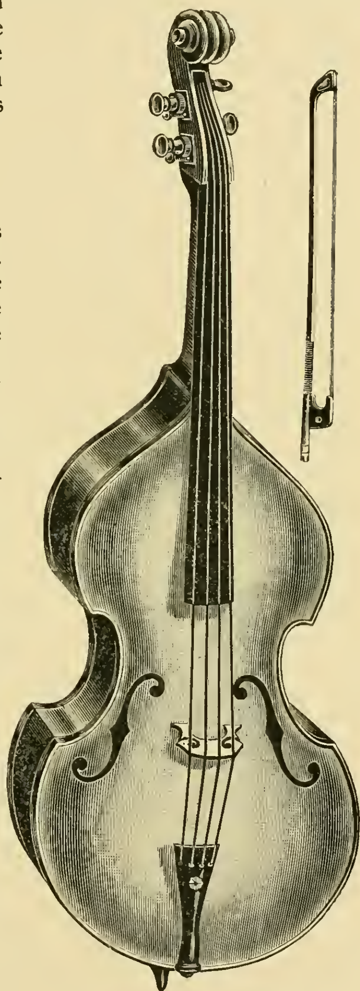


sounding, it must be always remembered, an octave lower. But in order to enlarge the downward compass of the instrument, some players tune the third string a tone lower, down to G. It was formerly the custom in France to tune the three-stringed basses by fifths, an octave lower than the three higher strings of the violoncello ; but the tuning by fourths, which is more convenient for the fingering, is now generally adopted.

142. The four - stringed double-bass possesses a great advantage over that with three strings, in having a compass a fourth lower. It is generally tuned



but, as with the three-stringed bass, some players tune the fourth string a tone lower —down to the lower D. Other tunings are exceptionally used. At the beginning of 'Das Rheingold,' Wagner directs half his double-basses to tune their E string down to E flat, to sustain the long pedal-point with which the work opens ; and in the second act of 'Tristan' two double-basses have for a few bars to tune their E string down to C sharp.



THE DOUBLE-BASS (CONTRABASSO)

143. In consequence of the great length of its strings, the fingering of the double-bass differs much from that of the violin or violoncello, and the different methods of tuning render it impossible for us to give a table of the fingering as we did for the other instruments. It will suffice to say that the compass is from the lower A or E, as the case may be, to



with, of course, all the intermediate semitones. The highest notes, however, are seldom used, being of inferior quality.

144. Double notes (with the possible exception of those in which the upper note is the octave of an open string), are hardly ever employed, and chords of more than two notes should be avoided altogether.

145. Owing to the length and thickness of the strings of the double-bass, passages of more than a moderate degree of rapidity are very ineffective. True, the orchestral players of the present day are for the most part able to execute them, but the thick strings are slow at changing their rate of vibration, and the passages almost always sound confused and unclear. Sometimes, as in the 'Storm' of the Pastoral Symphony, where Beethoven paints the muttering of the tempest, they may be capable of great effect; but modern composers too often use them without such justification. For example, such a passage as the following



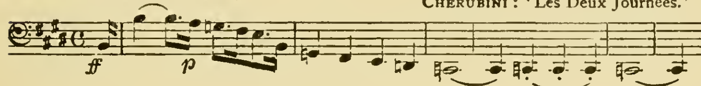
at the speed indicated by the composer (♩ = 116), even though doubled in the octave by the violoncello, can never be wholly satisfactory in performance. On the other hand, repeated notes and the *tremolo* are very effective. The latter, however, should not be too long continued, as it soon becomes fatiguing to the player.

146. *Sordini* are seldom employed on the double-bass, probably because they produce much less difference in the quality of tone than on the other strings. Natural *harmonics* are possible, though very seldom used; the fingering of the double-bass renders artificial harmonics altogether impracticable.

147. The *pizzicato* of the double-bass is very impressive and sonorous; it is very often employed while the other strings are played with the bow, as in Ex. 43. We shall see other instances presently. Owing to the greater length of the strings, the sounds are more prolonged than with the more acute instruments.

148. As has been already said (§ 140), the primary function of the double-bass is to double the violoncello in the octave below. It is therefore in many cases, especially by the older masters, written upon the same staff. But, it will be remembered, the violoncello goes down to the C below the staff, while the four-stringed bass only descends to E, when tuned in the usual manner, and that with three strings only to A, or at lowest G. When, therefore, a passage occurs in which the celli take their lowest notes, as, for example, in the following—

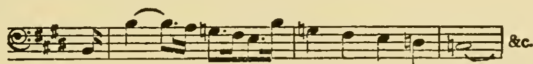
Ex. 52.



it is clear that the double-basses must play in the unison, instead of in the octave below, as soon as the extreme notes of their compass are exceeded.* The passage just given might be modified by the players in various ways. A player on a four-stringed instrument would probably play



or, if his fourth string were tuned down to D (§ 142), he might change at the C♮. But if he had only a three-stringed bass, he would rise a seventh after G♮, if his third string were tuned to G, otherwise he would play



Similar passages are frequently to be found, especially in the scores of the older masters. A striking example will be seen in the last 17 bars of the first movement of Beethoven's ninth symphony. In all such cases, it will be best for the composer to write a separate part for the contrabass, indicating exactly what notes he wishes played; otherwise confusion is sure to result.

* To obviate this inconvenience some German instrument makers have lately constructed a double-bass with a fifth string, tuned to C, the octave below the open C of the violoncello; but this instrument is not yet generally introduced into the orchestra.

149. We have just seen a case where it is *necessary* for the contrabass to double the violoncello in unison; but this is also occasionally done for a special effect through a whole passage, to reinforce a melody in the bass, as in the opening of one of Haydn's symphonies.

Ex. 53.
Adagio. HAYDN: Symphony in E flat.
V'cello (e Fagotti, *unis.*). Timp. *p* *p*
C'Basso. *p*

The symphony opens, as shown, with a roll for the drum, unaccompanied. The effect of the unison in the following bars is quite different from that which would have been obtained had the celli played, as usual, the octave above the basses. In the last bar but one the score is completed by the addition of the chord of the dominant seventh on the wind instruments above the basses, which is resolved on the tonic chord in the following bar.

150. Our next illustration

Ex. 54.
Larghetto con moto. SPOHR: 1st Symphony, Op. 20.
Sopra una corda.
V'cello. *p*
pizz.
C'Basso. *p*

zf *p* &c.
zf *p*

shows only two-part harmony; the double-basses giving a light pizzicato accompaniment to the expressive melody played on the second string by all the celli.

151. The following passage

Ex. 55. BEETHOVEN: 'Christus am Oelberge.' ('Mount of Olives.')

Allegro.

Viol. 1o. Viol. 2do. Viola. Jesus. V'cello. C'Basso.

Va - ter, tief ge-beugt und kläg - lich, fleht dein Sohn hin - auf zu dir,

shows the pizzicato of the basses accompanying sustained harmony for the other strings. Note that for the greater part of the phrase the basses are within an octave of the celli. When these instruments have different parts, as here, it is seldom good to separate them too widely.

152. When the two instruments are written upon the same staff, but have separate parts, care must be taken to turn all the stems of the celli upward, and those of the basses

downward, to avoid confusion. The close of the 'Credo' of Schubert's first mass illustrates this point, and also gives an example of a pizzicato bass divided between the two instruments.

Ex. 56. *Andantino.* SCHUBERT: Mass in F, No. 1.

Viol. 1º. Viol. 2do. Viola. V'cello. e Basso. pp pizz. arco.

In the score Schubert has quite needlessly put dots (the sign for staccato,) to the bass parts. This is, of course, quite superfluous, as it is impossible to obtain a *legato* with the pizzicato.

153. Unlike the other strings, the double-basses are very seldom divided, excepting sometimes to play in octaves, as in Ex. 49. Double notes and chords so low down produce an effect of thickness, which is only used for very special effects. In his 'Symphonie Fantastique,' at the beginning of the 'Marche au Supplice' (March to Execution), Berlioz, to obtain a sombre, sinister tone from his orchestra, writes chords in four parts, pizzicato, for his double-basses—

pizz. pp &c.

and Meyerbeer in 'Dinorah' has a passage in which both celli and bassi are divided into three parts:—

Ex. 57. *Allegro.* MEYERBEER: 'Dinorah.'

V'celli. *a* 3. pp C'Basso. *a* 3. pp

A somewhat similar effect will be seen in the first movement of Liszt's 'Dante' symphony.

154. One of the most curious and interesting examples of the division of the double-basses will be seen at the commencement of Tschaïkowsky's 'Symphonie Pathétique':—

Ex. 58. *Adagio.* 1º Solo. TSCHAÏKOWSKY: Symphonie Pathétique.

Fagotti. *pp* *p* *mp* *sf* *p*

div.

Viola. *mp* *sf* *p*

div.

C'Basso. (senza V'cello.) *pp* *cresc.* *sf* *p*

It is unusual to find the double-basses without the violoncellos, as here; it is probably unique to see three-part harmony for double-basses and one bassoon, the melody for the latter being the middle part of the harmony. The whole symphony is full of novel experiments in orchestration, and this weird opening is by no means one of the least remarkable.

155. Owing to its very deep pitch, and the comparatively little variety of its tone, the double-bass is hardly ever used in the orchestra as a solo instrument. The only example, so far as we know, of its employment in this capacity by the great composers is in the bass song by Mozart, "Per questa bella mano," which has an obligato for the contrabasso. This solo part is extremely curious. It is written in the G clef throughout, and not only rises to an extraordinary height, but contains double-stops, and even chords, which some of the most eminent double-bass players of the present day declare to be quite impossible on the instrument. We quote two short passages, the first (*a*) showing the extremely high notes written by Mozart, and the second (*b*) the double-stops and chords just spoken of.

Ex. 59. *Andante.* (*a*) MOZART: Aria, "Per questa bella mano."

tr

Allegro. (*b*)

The chord at the end of (*b*) would be only possible if the A were an open string. In that case, if the double-bass were of the usual kind, the part must sound *two octaves* lower than written. The whole solo is a problem of which we do not possess the key. Possibly it was written for some specially constructed small-sized bass, on which the strings were shorter, and the fingering different. The late Signor Bottesini used to play on a smaller instrument than those used in the orchestra the solos with which his name is associated.

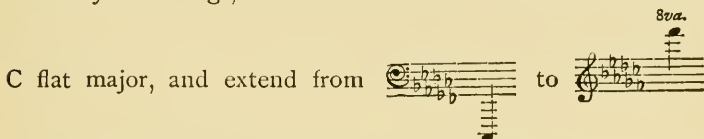
CHAPTER V.

THE HARP, GUITAR, AND MANDOLINE.

156. In the present chapter we deal with those stringed instruments which belong to the second group (§ 26). Though not generally reckoned among the "strings," their appropriate place in this book is here. The only one which will detain us long is

THE HARP.

157. The modern Harp (*Fr.* Harpe, *Ital.* Arpa, *Ger.* Harfe,) has forty-six strings, which are tuned to the diatonic scale of C flat major, and extend from



to a compass of six and a half octaves. Music for the harp is written, as for the piano, on two staves, in the G and F clefs. As the natural scale of the instrument is C flat, every note will of course be a flat.

158. If other notes than those of the scale of C flat major are required on the harp, these are obtained by the ingenious mechanism known as the "double action," which was invented by Sebastian Erard, and brought to perfection by him early in the present century. We have not space to describe this apparatus fully ; it must suffice to say that by means of seven pedals fixed in the pedestal of the harp, the player is able to raise the pitch of any degree of the scale either a semitone or a tone. If a pedal be pressed half-way down, the note is raised a semitone, if pressed fully down, a tone. At one side of the grooves in which the pedals work are two notches, into which they can be hitched when required.

159. It must be understood that each pedal acts on all the octaves of the same note,—that one pedal will raise every C♭ to C♮ or C♯, another will raise every D♭ to D♮ or D♯, and so on with all the seven. But it is no more possible to *lower* the pitch of the string by means of the pedals than it is to obtain a lower note than the open string by stopping the string of a violin.

160. The student will now be able to understand why the natural scale of the harp should be C♭. By pressing the F pedal half-way down, we get the scale of G flat (F♮

instead of F♭); similarly we can raise all the other flats to naturals, until, if all the pedals be pressed half-way down, we have the scale of C♮. If we now put the F pedal fully down, we have the scale of G, if the F and C pedals, the scale of D, and so on. It is thus possible by means of the pedals to put the harp into any key that may be required. A moment's thought will show the student that the minor diatonic scales can be similarly obtained.

161. The fingering of the harp being the same in all keys, and therefore all being equally easy, it might be supposed that it would be a matter of indifference in what key a harp part was written. This is not the case ; the less the strings are shortened, the better their sonority. For this reason, if the harp be employed in a movement containing many sharps in the signature, it is better to write the part, if possible, in the enharmonic key. The author has done this for a movement in the key of F sharp major in his cantata 'Alfred' :—

Ex. 60.
Andante amoroso. E. Prout : 'Alfred.'

Wind Instruments. Fl. Clar. *pp* Cor. Fag. &c.
Arpa. *p*

(To save space, the wind parts are condensed on two staves, and the actual sounds are given. The student will learn later that both the clarinets and the horns would be written quite differently in the score.) Here the harp part would have been just as easy to *play* had it been written in F♯; but in that case all the strings except the B would have been raised a tone ; whereas by taking the enharmonic key, G , only one pedal (the F,) has to be put half down. The sonority of the harp is therefore much greater. Composers sometimes disregard this point. M. Gevaert, in his splendid book on "Instrumentation," quotes a long harp passage, from the fifth act of Gounod's 'Faust,' in the key of B major, and points out that it would have been not only more effective, but very much easier had Gounod written it in C flat.

162. From what has been said about the mechanism of the harp, it will be seen that neither double-sharps nor double-flats are possible on it. They are sometimes written in thoughtlessness, especially by Wagner, who wrote worse for the harp than any other great composer. In such cases the performer has to play the enharmonic of the note—*e.g.*, for B♭♭ he will play A♮, for F× he will substitute G♮, and so on.

163. It must never be forgotten in writing for the harp, that it is *essentially a diatonic instrument.* Modulations to nearly related keys are easy; but it must be remembered that, as each foot can only move one pedal at a time, and that every accidental requires the use of a separate pedal, sudden changes to a very remote key—such as from C to B♮ or to D♭—will be difficult, and may even be impossible. If such a change be required, a short rest should be given to the harp, to allow the player sufficient time to change his pedals.

164. To show the student how NOT to write for the harp, we quote an almost impossible passage from the final scene of 'Die Walküre.'



Here almost every group of semiquavers requires the changing of two, sometimes of three pedals. The entire passage is absolutely antagonistic to the nature of the instrument.*

165. Provided that chromatic passages be avoided, most passages that would be suitable for the piano will also be satisfactory on the harp, excepting rapid repeated notes and shakes, which, though mostly possible, are ineffective. But

* One of the best harpists in London, the late Mr. Ernest Lockwood, once informed the author that he had to practise this passage an hour a day for some weeks, before he was able to play it at one of the Richter concerts.

there are a few general principles which the student will do well to bear in mind. It may be said that the most effective passages for the harp are chords, either sounded together, or in arpeggio. But, as the little finger is never used in harp playing, no chord for either hand should contain more than four notes. Moreover, if there be only one harp part, the two hands should not be too widely separated, or the effect will be thin. Neither should both hands play long in the lower part of the instrument, as this necessitates a constrained position for the performer, which soon becomes fatiguing.

166. Arpeggio passages (which, it may be remarked in passing, derive their name from this instrument,) are even more common, and perhaps more effective than the full chords just spoken of. They are sometimes given to one hand alone, and should then lie within the compass of an octave ; but they are very often divided between the two hands. In this case the method of dividing them is sometimes indicated by the composer, but it is more frequently left to the player. For the student, unless he be himself a harp player, the latter will be the better plan.

167. An excellent example of a simple arpeggio for the harp as an accompaniment to the voice is the following :—

Ex. 62. Schumann : 'Faust.'

Lento.
Oboe 1º
p espressivo.
Corni in G. (sounding a 4th lower.)
p
Arpa.
dolce.
Viol. 1, 2.
con sord.
p
Viola
con sord.
p
Voice.
p
Höch............ ste
Bassi.
pizz.
p

Herr - scher - in der Welt!

cresc. *p*

cresc. *p*

cresc. *p*

las - - se mich........ im blau - en aus - - ge .

- spann - ten Him - - mels - zelt,

&c.

(To save space, the two violin parts are written on one staff.) The quiet harmonies for the muted strings, with the occasional holding notes for the horns, allow the harp passage to be heard with great distinctness. Observe also how the pizzicato basses reinforce the lowest notes of the harp, which they double in the lower octaves.

168. In the passage just quoted the division of the arpeggios is indicated; in the following it is left to the player:—

Auber: 'Le Cheval de Bronze.'

Ex. 63.

Allegro moderato.

Arpa.

Viol. 1, 2. Viola.

Stella.

En vain de mon jeune â - - - - - - ge leur

V'cello.

169. In our next illustration is seen the beautiful and uncommon combination of the harp with three solo instruments—the violin, violoncello, and horn.



The distribution of the chords in the first bar exemplifies what was said in §165, and the notation in the third bar shows the division of the arpeggio between the two hands.

170. The combination of the harp with the strings pizzicato is not infrequent, and very effective, as in the following :—

Ex. 65.

Andante. MENDELSSOHN : 'Oedipus.'

Arpa. mf f p

pizz.

Viol. 1º mf f p

pizz.

Viol. 2do mf f p

pizz.

Viola. mf pizz. f p

Bassi. mf f p

Other excellent examples of the same combination may be seen in Mendelssohn's overture to 'Athalia,' and in the song of the Rhapsodes in Bruch's 'Odysseus.'

171. A very beautiful effect is obtainable by the use of the *harmonics* of the harp. These have a peculiarly clear tone, somewhat resembling in quality the harmonics of the strings. The only note of the series employed on the harp is No. 2, giving the octave of the note sounded by the whole string. It is produced by touching the string exactly in the middle with

the fleshy ball of the palm of the hand, and twitching the string with the thumb or one of the first two fingers. It is not equally good in all parts of the compass, and is seldom written for notes beyond the limits

172. The notation of the harmonics of the harp differs from that used for other stringed instruments. The general plan is to write, not the actual sound to be produced, but the string to be touched, putting o over it. The note sounded is thus always an octave higher than that shown in the score. Thus, the following passage, taken from Boieldieu's 'La Dame Blanche'—which, it should be said, is the earliest instance of the employment of the harmonics of the harp—

sounds in performance thus :—

173. A charming example of these harmonics is seen in the popular Ballet of Sylphs in Berlioz's 'Faust.' We quote the concluding bars in which the harmonics of the two harps, unaccompanied except by the holding D of the basses, are given as softly as possible.

Ex. 66. *Mouvement de Valse.* Berlioz : 'La Damnation de Faust.'

Clarinetti in A. (sounding a minor 3rd lower.)
pppp
Timpani in D, A.
ppp
Arpa 1.
natural sounds.
ppp
pppp
Arpa 2.
natural sounds.
ppp
(presque-rien.)
pppp
Bassi.
ppp

174. Some modern composers have obtained a striking effect on the harp by means of what are called *synonyms* or *homophones*, which we shall now explain. It was said in § 162 that if double-sharps or double-flats were written for the harp, it was necessary to play their enharmonics. In some cases two notes which are enharmonics of one another can be sounded on two adjacent strings of the harp. The following table will show in what cases this is possible :—

Ex. 67.



Here it will be seen that nine out of the twelve semitones in the octave have practicable enharmonic synonyms. The three notes, D♮, G♮, and A♮, are without them, because, as the nearest natural note on each side of them is at a distance of a tone, their enharmonics must be either double-sharps or double-flats.

175. Now if, by means of the pedals, we tune the harp thus :—

(1) C♯, D♭, E♮, F♭, G, A♯, B♭,
(2) D, E♯, F♮, G♯, A♭, B♮, C♭,
(3) D♯, E♭, F♯, G♭, A, B♯, C♮,

the student will see that, instead of a diatonic scale, we have now in each case a chord of the diminished seventh, with three of the four notes doubled ; it is obviously impossible to double all, as the harp has only seven strings in the octave. The three chords shown above are—



By the *glissando*, that is, by sliding one finger along the strings, an arpeggio of the chord of the diminished seventh can be obtained on the harp without the slightest difficulty, with any degree of force from *pp* to *ff*, and at almost any rate of speed that may be desired. As an illustration, we give part of the cadenza for the harp in the first movement of Liszt's 'Dante' symphony :—

Ex. 68. LISZT: 'Dante' Symphony.

ff

8va

loco.

&c.

This passage is continued upwards to the upper D again, and then, after a pause, repeated *diminuendo* and *pianissimo*. The effect is evidently

&c.

and the passage would be more frequently written in this way, the enharmonic changes being left to the player.

176. By the older composers the harp was seldom employed. We occasionally find it in the works of Handel—an example will be seen later in this chapter; but we know of no instance of its use by Haydn. It is found only once in the complete works of Mozart—in the concerto for flute and harp which he was commissioned to write for the Duc de Guines, and only twice in Beethoven—in the 'Prometheus' and in 'Leonora Prohaska.' Weber also never, so far as we are aware, employed it. But in modern, and more especially in operatic scores, it plays a very important part. Gounod, Meyerbeer, Berlioz, and Wagner make very free use of it, though the last-named composer, as we have already seen, sometimes (not always) writes most injudiciously for it.

177. In modern large orchestras two, or even more, harps are not infrequently employed. In such cases the composer sometimes directs that the harp part shall be doubled; Brahms has done this in his 'Deutsches Requiem.' But the doubling of a harp part in unison by two or more instruments is less

effective, and adds less to the power, than when a separate part is written for each. The earliest instance known to us of this procedure is found in Schubert's 'Zauberharfe;' unfortunately the passage would require more space for its quotation than we can spare.

178. A very curious and interesting combination is the following:—

Ex. 69. *Allegro maestoso.* MEYERBEER: 'Le Prophète.'

Timpani in E♭, B♭, F. *p*

2 Arpa 1ª

2 Arpa 2ᵈᵃ

JEAN. avec exaltation. *f*

Roi du ciel et des an-ges, Je di-rai tes lou-an-ges Com-me Da-vid ton ser-vi-teur.

pp doux.

Here the voice is accompanied by very full chords for two harps (each part being doubled,) and kettle-drums, of which there are three. We shall see later that the more usual number is two.

179. Our next example shows a simpler, but not less

effective passage for two harps accompanying the divided violoncellos :—

Ex. 70. Rossini : 'Le Siège de Corinthe.'

Adagio non troppo.

Arpa 1ª

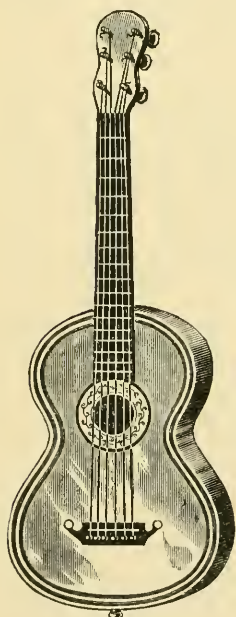
Arpa 2ᵈᵃ

V'celli 1, 2.

&c.

Let the student notice the way in which the harmonies are distributed between the two harps. The only point needing special remark is at the tenth bar, where E♭ is written for the first harp and D♯ for the second, the reason probably being that the context makes the passages easier to play with the notation chosen than if either E♭ or D♯ had been written for both instruments.

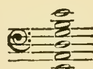
180. In the final scene of 'Das Rheingold' Wagner has written separate parts for six harps. The passages consist entirely of arpeggios, crossing and interlacing in various positions, which give a peculiar *shimmer* (if the expression may be allowed,) to the orchestration, at the point where the rainbow bridge is seen by which the Gods pass over to Walhalla. Such an effect is, of course, quite exceptional, and the student should confine himself to one harp part, or he will throw difficulties in the way of a performance of his music.



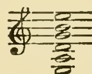
THE GUITAR.

THE GUITAR.

181. The Guitar (*Fr.* Guitare, *Ital.* Chitarra), though mostly used as a solo instrument for the accompaniment of the voice, requires a few words of mention, as it has been occasionally employed in the orchestra. It has six strings, which are generally tuned thus:



Like the double-bass, the guitar is a transposing instrument, and music for it is written an octave higher than the actual sounds, on one staff only, and in the G clef. The notes just given for the open strings would therefore be written as follows: —



182. The fingering of the guitar is complicated, and Berlioz, in his well-known treatise on Orchestration, says that it is almost impossible to write well for the instrument unless one can play it.* We therefore do not propose to enter into this

* A friend of the author's, who plays the guitar, goes even further, and declares that it is *absolutely* impossible.

question, and shall content ourselves with giving two examples of the actual use of the instrument.

183. The first of these will be the opening of Reiza's solo in the first act of 'Oberon.'

Ex. 71.

Andantino.

WEBER: 'Oberon.'

REIZA.

Chitarra.

O why art thou sleep-ing, Sir Huon the brave? A maid-en is weep-ing on Ba-by-lon's wave!

This solo is preceded by six bars for wind instruments. The voice is accompanied by the guitar alone; the student must not forget that the part sounds an octave lower than written.

184. As the tone of the guitar is weak, it is important that if other instruments are used with it, the accompaniments should be very light. This point has been carefully attended to in our next example:—

Ex. 72.

Allegro.

(Sounding a major 9th lower.)

AUBER: 'Le Duc d'Olonne.'

Corni in B♭ *basso.*

pp

Viol. 1º

pp

Viol. 2do

pp

Viola.

pp

LE CHEVALIER.

Vers ton bal-con je cher-che l'au-ré-ol-e

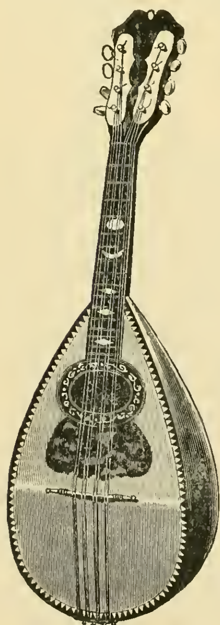
Guitar (*on the stage*).

V'celli.

pp

dont........ s'é - clai - - - re mon ho - ri - zon,........

In the score Auber has exceptionally written the guitar part in the F clef, and with the actual sounds. In our quotation the part is given with the usual notation.



THE MANDOLINE.

THE MANDOLINE.

185. The Mandoline (*Ital.* Mandolino,) is a survivor of the formerly very important family of Lutes. There are several kinds of mandoline, which differ in their number of strings, method of tuning, &c. But all resemble one another in that they are played with a plectrum, generally made of tortoiseshell, which the player holds in his right hand, while with the fingers of the left he stops the strings, exactly as on the violin.

186. The most commonly used mandoline, and the only one of which it is necessary to speak, is the Neapolitan. This has eight strings, or we should rather say four double strings tuned in fifths like the violin. Each note is sounded by two strings in unison.

1st double string
2nd ,, ,,
3rd ,, ,,
4th ,, ,,

The tone of the mandoline is thin and somewhat nasal, but not unpleasing. The instrument is best fitted for the performance of simple passages, and should not be written for higher than E, the octave of the open string. The fingering is the same as that of the violin.

187. The mandoline is very seldom used in the orchestra; the best known instance of its employment is in the serenade "Deh vieni alla finestra" in 'Don Giovanni.' As the score of this opera is readily accessible, we give two less familiar examples. The first is the earliest we have met with, and is found in one of Handel's least known oratorios.

Ex. 73. Handel: 'Alexander Balus.'

Andante.

Arpa e Mandolino.

V'cello 1°. pizz.

V'cello 2do. pizz.

C. Basso. pizz.

Here the harp part, which is very simple, is written on one staff;* the mandoline, it is obvious, plays the melody in unison with the upper notes of the harp, and the harmony is filled up by the violoncellos and double-basses, all pizzicato.

188. Our second example, by Paisiello,

* Another example of the same procedure will be seen in the second act of Gluck's 'Orphée,' where the harp part consists largely of single notes.

Ex. 74.

Lento amoroso. PAISIELLO: 'Il Barbiere di Siviglia.'

Clarinetti in B♭. (sounding a tone lower.)

Mandoline.

Viol. 1, 2.

Viola.

Bassi.

p

sotto voce.

pizz.

p

p

p

3 3 3 3

Corni.

shows the combination of the mandoline with violins pizzicato, while the violas and basses are playing *col arco*, and two clarinets sustain the harmony. The student will see here an example of what was spoken of in §114—the doubling of the basses by the violas. The harmony for the strings is here only in three parts.

189. The Lute, referred to in §184, is now obsolete. Wagner has written a part for it in Beckmesser's serenade in the second act of 'Die Meistersinger,' but the part is almost invariably played on the harp, which is far more effective. The lute, and its near relation, the *Theorbo* or Arch-lute, are, however, frequently to be met with in the works of Handel, and Bach has written an air with an *obligato* for the lute in the second part of his 'Johannes Passion.'

190. Of the only remaining stringed instrument of any importance—the Pianoforte—we do not propose to speak here, because it is hardly ever treated as a part of the orchestral forces. We shall deal with its combination with the orchestra in concertos, &c., in a later part of this work, and we have already, in an earlier volume of this series (*Applied Forms*, Chap. II.), entered in some detail into the proper manner of writing for it.

CHAPTER VI.

WIND INSTRUMENTS: THE FLUTES.

191. Of all existing wind instruments, the FLUTE (*Fr.* Flûte, *Ital.* Flauto, *Ger.* Flöte) is one of the oldest. Two varieties were formerly in use, the 'Flûte-à-bec' and the 'Flûte Traversière,' or 'Flauto Traverso.' The former, the name of which means the 'Beak-Flute,' was so called because it was blown at the end through a mouthpiece. It was the predecessor of the modern flageolet, and is frequently to be found in the scores of Bach, and exceptionally also in those of Handel.* As this older kind of flute is now entirely obsolete, it is only necessary to add, for the sake of students, that in Bach's scores the part for this instrument is often written in what was known as the 'French violin clef,' that is, the G clef on the *first* line of the staff, instead of on the second. The only flutes with which we have to deal are those which, from their being held sideways, and blown through a hole in the side of the tube, were formerly called 'Flauto Traverso,' that is 'Crosswise Flute,' parts for which are often indicated in Handel's scores by the single word 'Traverso,' or 'Traversière.'

THE ORDINARY FLUTE.

192. The Flute most frequently employed in the orchestra is that sometimes described as the concert flute. It was for-



THE FLUTE.

merly always made of wood, and with a conical tube, narrowing toward the lower end. More modern flutes are also made with cylindrical tubes, the bore being of the same diameter throughout, and are frequently constructed of metal.

193. The tube of the flute is perforated with holes, which

* In Handel's operas, 'Tamerlano' and 'Rodelinda' are to be seen parts both for the older Flûte-à-bec (in the score marked simply 'Flauto') and for the modern flute (marked 'Traverso').

are closed either by the fingers of the player direct, or by keys acted upon by the fingers. There is also a hole near the upper end of the tube through which the player blows, and his breath puts in vibration the column of air in the tube, and thus produces the tone. If all the holes in the side of the tube are closed, the length of the vibrating column of air will be that of the tube itself; but by opening the holes in succession, either by lifting the fingers from them, or by releasing the keys that close them, the column of air is artificially shortened. In the ordinary flute there are six holes, closed by the first three fingers on each hand, which, when opened one by one, give the scale of D major. The intermediate semitones are obtained by opening other holes in the tube by means of keys. Additional keys at the lower end of the instrument give the two notes, C and C sharp, below the D first spoken of. The compass of the lower register of the instrument is therefore from to , chromatic. Music for the flute is always written in the G clef.

194. The notes of which we have just spoken are the fundamental notes of the tube. By increasing the pressure of air, the player causes the instrument to sound the second note of the harmonic series instead of the fundamental; this gives with the same fingerings the medium register of the flute, extending from to .

195. By still further increasing the pressure of air, and by means of what are known as "cross fingerings" (a purely technical detail, into which we need not enter) the notes of the upper, or acute register are obtained. These are some of the higher "upper partials" (the third, fourth, and fifth notes of the harmonic series,) and extend from D to C

The two highest notes (B♮ and C,) are difficult to obtain, and harsh.

196. It will be seen that the flute has thus a complete compass of three octaves. Some modern flutes have an extra semitone (B♮,) below; but as this note is not on the very large majority of instruments, the student had better abstain from writing it. Dvořák has introduced it in his first 'Slavische Rhapsodie,' and in his 'Stabat Mater';

but we remember no other instance of its employment by great composers.

197. What was said in § 193 of the fingering of the flute referred to the older variety, sometimes known as the "eight-keyed flute." On this instrument it resulted naturally from its mechanism that those keys were the easiest to play in which were the nearest to D major—*e.g.* keys with not more than three sharps or flats. But about the year 1832, Theobald Boehm, a native of Munich, invented a new mechanism for the flute, which gave not only more perfect intonation but greater power to the instrument. This flute, called, after its inventor, the 'Boehm flute,' is now used by most flute players.



THE BOEHM FLUTE.

We need not discuss the details of its fingering, but will merely say that, among its other advantages, the difficulties of fingering in the different keys are so far equalized that it is no longer needful for the composer to take this point into special consideration.

198. Almost any passages are practicable on the flute, which has more agility than any other wind instrument. Large skips, even in rapid movement, as in the well-known passage in the overture to 'Guillaume Tell,'

ROSSINI: 'Guillaume Tell.'



offer comparatively little difficulty. With a few exceptions, shakes, whether with a semitone or a tone, are easy; the following are those which should be avoided:—



with, of course, their enharmonic equivalents—*e.g.* B♭ A♭, for A♯ G♯, &c. It is also best not to write shakes on the

highest notes of the instrument, as many of these are only possible on the Boehm flute.

199. The quick repetition of the same note is easier on the flute than on any other wind instrument, and is produced by what is known as "double-tongueing."* It is most used in flute solos, but can also be very effectively employed in the orchestra, as in the following example.

Ex. 77. *Allegro assai.* RAFF: 3rd Symphony.

Flauti. Viol. 1, 2. Viola. V'cello.

Let the student notice the third and eighth bars of the flute part in this passage. He will see the accidental sharp to C marked twice in each bar. It is important for him to remember that when two instruments are written on the same staff, as with the wind in most scores, any accidentals occurring *must always be noted for both instruments.* This is the invariable practice of composers; the reason probably is that in drawing out the parts from the score the copyist writes each on a separate staff. In the third bar, if the sharp were not put against the C of the second flute, it is almost

* For a full explanation of double-tongueing, see Grove's 'Dictionary of Music,' Vol. I., p. 459.

certain that the copyist would overlook its having been in the first flute part, and would omit to insert it. To save space, we have put both the violin parts on one staff. In the last bar they cross ; in such a case the student must be very careful to turn the stems for the first instrument up wards, and for the second downwards.

200. The employment of the flutes in the orchestra is very diversified. In *tutti* passages they sometimes double the melody of the first violins, either in the unison or in the upper octave ; at other times they have sustained harmonies on their upper notes. In passages for the wind alone, the flute usually (as the most acute of the wind instruments,) takes the upper part, though its lower notes are sometimes used to fill up the harmonies below a melody given to the oboe or clarinet. But it is in solo, or *quasi*-solo effects, in combination with only a few instruments that it is heard to most advantage. It is with these that we shall now chiefly deal ; other methods of employing the flute will be seen when, in our next volume, we treat of orchestral combination.

201. The lower register of the flute has a sweet, slightly reedy quality of tone, especially on instruments with a cylindrical tube. Being not very powerful, it is needful that, if used in solo passages, it should be very lightly accompanied.

Ex. 78.
Allegro maestoso. AUBER : 'L'Enfant Prodigue.'

Flauto. *p dolce.*
Viol. 1, 2. pizz. *p*
Viola. pizz. *p*



Here will be seen an example of what was mentioned in § 113—the bass of the harmony given to the violas alone.

202. Our next example

Ex. 79.

Dvořák: 2nd Symphony.

Vivace.

Flauto. Timpani in D, A. Viol. 1, 2. Viola. V'cello.

requires little comment; the disposition of the harmonies deserves attention. Observe also that the double-stop on

the violoncelli is perfectly easy, no division of the instruments being required here.

203. The medium notes (second octave,) of the flute, less reedy than those of the grave register, have a pure limpid quality, extremely effective in a sustained *cantilena*. We quote an admirable example from Gluck's 'Alceste'—the opening symphony of Alceste's pathetic air, "Ah! malgré moi, mon faible cœur partage."

Ex. 80. GLUCK: 'Alceste.

Lento.

1 Flauto.
1 Oboe.
1 Corno in C. (sounds an 8ve lower.)
Viol. 1º pizz.
Viol. 2do Viola unis. col V. 2.
V'celli. pizz. V'c.
C'Basso. C.B. pizz.



This passage deserves close examination. Notice first the simple, yet most expressive melody for the flute ; then the contrast between the arpeggio figure of the second violins, doubled in unison by the violas, and the pizzicato of the other strings—the first violins being divided throughout. Observe further the sustained notes for the oboe and horn, which prevent any effect of thinness in the harmony. The wide separation of the cello and double-bass (two octaves and a fifth,) at the end of our quotation is hardly to be recommended. It would have been better to reinforce the low F of the bass in the upper octave. The whole passage is a beautiful illustration of how much effect can be obtained by very simple means.

204. Florid solo passages are much more frequent on the flute than such as are shown in our last extract, and in Ex. 78. We may name the flute solos in Beethoven's third 'Leonora' overture and in the scherzo of Mendelssohn's 'Midsummer Night's Dream' music as instances. We give a less familiar example.

Ex. 81. CHERUBINI : 'Médée.'

Allegro.

Flauto.

Viol. 1, 2. *p*

Viola.
Bassi.
pizz.

205. Our next illustration shows a flute solo simply but effectively accompanied by the staccato semiquavers of all the violins *pp*.

Ex. 82.
Andante. HAYDN: Symphony in C, No. 60.

Flauto. *p* *pfz*

Viol. 1, 2, *unis.* *pp* sempre staccato.

&c.

206. Passages for two flutes in thirds or sixths, such as the following, always produce a good effect.

Ex. 83. MOZART: 'Cosi fan tutte.'

Andante.

Flauti. Fagotti. Viol. 1, 2. Viola. Bassi.

&c.

Observe here the *echoing* of the flutes by the bassoons, a point of which we shall speak later.

207. The romance in the second act of 'Fra Diavolo' shows a charming combination of two flutes with pizzicato strings. We quote the first bars :—

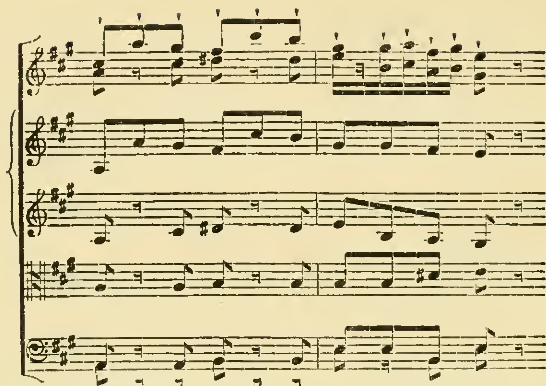
AUBER: 'Fra Diavolo.'

Ex. 84.

Andante con moto.

Flauti. Viol. 1º. Viol. 2do. Viola. V'cello. e Basso.

pizz. pizz. pizz. V'c. pizz. C.B.



208. Quite different in effect, and very ingenious, is the following passage from Mendelssohn's operetta known in this country as 'Son and Stranger.'

Ex. 85. MENDELSSOHN: 'Heimkehr aus der Fremde.'

Con moto.

Flauti. *pp*

Viol. 1º pizz. *pp*

Viol. 2do pizz. *pp*

Viola. pizz. *pp*



By comparing this passage with Exs. 77, 78, and 84, in all of which the combination of the flute with pizzicato strings is employed, the student may form some idea of how inexhaustible is the variety to be obtained even with the use of the same few instruments.

209. Our space will not allow us to quote nearly all the examples we had noted of the effective employment of two flutes; for our last illustration we select a beautiful and familiar passage, in which the middle parts of the harmony are given to these instruments, while the violins play the melody in octaves.

Ex. 86. MENDELSSOHN: 4th Symphony

Andante con moto.

Flauto 1º

Flauto 2do

Viol. 1º

Viol. 2do

sempre stacc.

Bassi.

&c.

Every one who has heard the Italian symphony will remember the lovely effect of this passage. The student will notice that

the two flutes are here written on separate staves, and will see an illustration of what was said in § 46.

210. Occasionally more than two flutes are employed in the orchestra. We are not referring now to the exceptionally large orchestra to be found in Wagner's scores (§ 43), but to the *incidental* employment of an additional flute. An instance, familiar to all musicians, will be seen in the symphony which opens the third part of Haydn's 'Creation.' Verdi, in his 'Requiem,' has employed three flutes in a manner as novel as it is beautiful, to accompany a melody sung in octaves by two female voices :—

Ex. 87.
Andante. VERDI : 'Requiem.

Flauto 1°
Flauto 2do
Flauto 3do
Soprano. *Solo.*
Mezzo-Soprano. *Solo.*

do - - - - na,.................. do - - - na

e - is, do - - na re-qui-em... sem-pi - ter - - nam.

&c.

Though quite different in its effect, it will be seen that there is a certain analogy with the treatment of the flutes in Ex. 86.

211. Much more frequent than the use of three large flutes is the employment of a piccolo in addition to the two ordinary flutes. Of this instrument we shall speak later in this chapter. A piccolo with two flutes will be found in the finales of Beethoven's C minor and Choral symphonies, in Mendelssohn's finale to 'Loreley,' Auber's 'La Muette de Portici,' Meyerbeer's 'Robert le Diable' and 'Les Huguenots,' and in other works too numerous to mention.

212. Two varieties of the ordinary flute require a few words of mention. These are the Flute in D flat, and the Flute in E flat, which are commonly, but inaccurately called the Flute in E flat, and the Flute in F. Hitherto the only transposing instruments we have met with are such as sound notes an octave lower than those actually written ; such are the double-bass and the guitar. But we here find a different kind of transposition—that in which the note sounded differs from that written by more or less than an octave. To take first the Flute in D flat. The fingering of this flute is exactly the same as that of the ordinary flute, of which we have been speaking ; but, as the tube is rather shorter, the natural scale of the instrument, made by lifting the fingers successively from the holes in the tube, is now not the scale of D major (§ 193,) but *the scale of E flat major*, one semitone higher. This is the reason why this flute is often said to be in E flat. But as, with all other transposing instruments, the note C (as will be seen later,) is taken as the standard from which the variation of pitch is reckoned, it is illogical and inconsistent to adopt a different standard for the flute alone. As this flute is in pitch a semitone higher than the normal one, it is obvious that the fingering which on the ordinary flute gives C will now give D flat ; the correct name of the instrument is therefore the flute in D flat, and not in E flat.

213. The question is often asked by students, Why not write the transposing instruments at their real pitch, and thus make the scores easier to read ? This plan has been advocated by some musicians, and attempts have even been made to carry it out ; but the practical objections to it seem to have been overlooked. If the separate part for a player on one of these transposing instruments be written as it really sounds, it throws the labour of transposing it on the player himself. If, for instance, the note [musical notation] be required, and this note be written in the part, a player on a D flat flute must finger for

and on an E flat flute for , and so on. This will involve continual risk of mistakes, as the player has mentally to transpose everything a minor second or a minor third lower, according to the instrument on which he is playing. But if each note represents not a fixed pitch, but a fixed *fingering*, the matter becomes perfectly easy to the player. When he sees any note he knows at once what fingers to use, and the sound that is produced depends on the instrument he is playing at the time. Evidently, therefore, if the actual notes sounded be written in the score, they must be transposed in the separate part.

214. Inasmuch as an experienced copyist would do this without any difficulty, it would seem at first as if there were no more to be said against it. But there is an important objection to it from the composer's point of view, which more than outweighs the advantage of greater simplicity to the reader of the score. To write effectively, it is most necessary that the composer should write *practically*,—that is, that he should consider whether what he is writing can be played easily. We do not mean by this that he is never to write difficult passages ; but, if he disregards the point we are now discussing, he may, and very likely will, write what is so awkward and uncomfortable for the instrument as to be quite ineffective. This applies more to some other transposing instruments than to the flutes, and we shall see the point illustrated when we come to speak of the clarinets (§298), but we mention it here as showing the reason why the small amount of trouble involved in transposing should be thrown upon the composer.

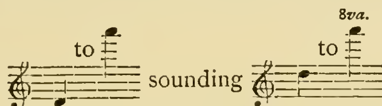
215. To return to the transposing flutes. The flute in D flat is only used in military bands, and need not detain us. The flute in E flat, sometimes called the THIRD FLUTE (*Flauto terzo*,) from its being a minor third higher than the ordinary flute, is very seldom to be met with. It is found in the first and last movements of Spohr's fourth Symphony ('Die Weihe der Töne'), in his Notturno for wind instruments, and in the second part of Gade's cantata 'The Crusaders';* but

* In Gade's work two E flat flutes are written in a movement in F♯ major, containing rapid semiquaver passages, doubtless because the music is thus in a much easier key. As the flute transposes a minor third higher, the part must be written a minor third *lower* than it sounds, *viz.*—in E flat. As illustrating the little difference in difficulty that exists between one key and another on the Boehm flute, it is worth while to mention that, at a performance of this work which the author conducted some years ago, both flute-players, not being provided with E flat flutes, played the parts at sight without fault in the key of F♯ major.

we know of no other instance of its employment by the great composers.

THE PICCOLO.

216. The PICCOLO (*Fr.* Petite Flûte, *Ital.* Flauto Piccolo,* *Ger.* Kleine Flöte,) is a flute an octave higher in pitch than the ordinary flute, which it otherwise closely resembles, excepting that it has not the two lowest notes, C and C♯. The part for it is always written in the G clef, *an octave lower* than the actual sounds produced. The compass is therefore from



It is *possible* to get the B♭ and B♮ above the A just given; but these two notes are not only difficult, but so extremely harsh and piercing that it is better not to use them.

217. The notes of the grave register of the piccolo (the lower octave,) are weak and colourless, and far inferior to those in the second octave of the flute, which are of the same pitch. The best part of the instrument is that lying between the D on the fourth line of the staff and the E, the major ninth above—sounding, it must be remembered, an octave higher. The highest notes of the piccolo can only be used in *forte* passages, and even then, from their piercing quality, should be sparingly employed.

218. All that has been said about the technique of the flute applies equally to the piccolo. Florid passages, rapid staccato, &c., are just as practicable and effective as on the larger instrument. But there is one important difference in the quality of the tone. It has neither the nobility nor the poetry of its larger relative. Such a solo as that given in Ex. 80 would, if played upon the piccolo instead of the flute, lose all its dignity, and sound simply ridiculous. The piccolo has nevertheless its special functions in the orchestra; these will be best seen in the examples we shall give.

219. With the exception, perhaps, of the big drum and cymbals, no instrument of the orchestra has been so much degraded by vulgar use as the piccolo. Nearly half a century ago, Berlioz in his 'Traité d'Instrumentation' protested against its abuse in being employed simply for the sake of noise. True, it can be used with great effect in a *tutti*, as at the end of the overture to 'Egmont.'

* In some of Mozart's Dances for orchestra the piccolo is indicated in the score as 'Flautino.'

Ex. 88.
Allegro con brio. BEETHOVEN: 'Egmont.'

Piccolo. *ff*
Tr. *Tr.* *Tr.*
Orchestra. *ff Tutti.* *Tutti.* *Tutti.*
Cor. Fag. *Cor. Fag* *Cor. Fag.*
Tutti.

As we are not now illustrating the treatment of the full orchestra, we have, to save space, condensed the score. The combination of the piccolo with the fanfare of the brass is here most excellent. Another well-known instance by Beethoven of the employment of the piccolo is in the Storm of the Pastoral symphony, where it is introduced with long holding notes in its upper register to depict the fury of the tempest at its highest.

220. But it is in solo effects, and more especially in *piano* passages that the piccolo is heard to most advantage. Examples of its employment in this way are to be found in Handel. Everybody knows the air "Hush, ye pretty warbling choir" in 'Acis and Galatea,' with its piccolo *obligato;* but there is an equally fine example (unfortunately too long to quote,) in his opera 'Rinaldo.' The song "Augelletti che cantate" is accompanied by two flutes and piccolo, the part for the latter being extremely florid. It is curious that the piccolo part is in the autograph marked 'Flageolet,' which has been changed to 'Piccolo' in Handel's own conducting score. Another charming example of a piccolo solo, *piano*, is seen in the air in Haydn's 'Seasons,' "With joy the impatient husbandman."

221. Among the composers of the present century, nobody has made more effective use of the piccolo than Auber. We quote two passages from his scores :—

Ex. 89.
Allegretto. AUBER : 'La Muette de Portici.'

Piccolo.
Clarinetto 1º in C.
Fagotti.
4 Corni in C. (sounding an 8ve lower.)
Viol. 1, 2. Viola.
Bassi.

Notice here the contrasts, both of rhythm and of colouring. Four distinct rhythmic figures are to be seen. Observe also the richness given to the middle harmonies by the chords for four horns.

222. The piccolo is often used to double some other instrument in the octave. In our next example

Ex. 90. AUBER: 'Le Cheval de Bronze.

Allegretto.

Piccolo.

Clarinetto in B♭. (sounding a tone lower.)

Viol. 1, 2. Viola.

Bassi.

&c.

a peculiarly piquant effect is obtained by its doubling a clarinet solo, not in the octave, but in the fifteenth

223. Our next quotation has more than one point requiring comment.

Ex. 91. DVOŘÁK: 5th Symphony. ('From the New World.')

Allegro molto.

Piccolo.

Corno 1 in E. (sounding a minor 6th lower.)

Trombe in C. a 2.

Viol. 1º

Viol. 2do

Viola.

V'c.

V'cello e Basso.

C.B. pizz.

Here we see a horn solo, repeated two octaves higher by the piccolo. The passage for the latter instrument would be quite practicable *at the same pitch* for the flute; but the composer here wants a very quiet effect, and the notes of the flute in its highest register could not be played *piano* enough; the passage is therefore given to the medium of the piccolo. Observe also that, while the horn and piccolo are marked *p*, the strings are marked *ppp*. Such refinements of *nuance* are a specialty of modern orchestral writing. In the older scores they are never to be found. The trumpets in C in the last bar sound as written. The sign 'a 2' (*a due*), which we have not met with before indicates that the two instruments which are written on the same staff play in unison. If the same sign is used for the strings, where there is only one part on the staff, it is equivalent to *divisi*; the latter term is more usual, and also preferable, as it is not capable of more than one interpretation. In Ex. 57 will be seen '*a* 3,' showing that the instruments divide into three parts.

224. It is seldom that more than one piccolo is employed in the orchestra. The best known instance of the use of two is in Caspar's drinking song in the first act of 'Der Freischütz'; in the following scena will be seen two piccoli in addition to two ordinary flutes. Spontini in the finale of the second act of 'Fernand Cortez' has employed the combination of two piccoli, two clarinets, horns, trumpets, trombones, and nearly all possible percussion instruments, behind the scenes, for the march of Mexicans (see within, Ex. 206). Berlioz in the third part of his 'Faust' has introduced *three* piccoli (see p. 252 of the full score). Such cases, however, are quite exceptional; we strongly advise the student in general not to use more than one, and in that case only to write for one other flute, as the piccolo part is generally played by the second flautist. We would add that in a very large majority of cases two flutes are preferable to one flute and one piccolo. The latter should only be used for special effects; the occasions for its appropriate introduction are rare.

225. As with the large flute, the piccolo is also made in D flat and E flat. Schumann in his 'Paradise and the Peri' has in the chorus No. 6 of the first part, a piccolo in D flat (incorrectly marked in the score as 'in E flat'—see § 212); but the reason is simply that, the key of the movement being B flat minor, the piccolo is thus written in A minor, an easier key. Spohr also uses the same instrument, again described as 'Piccolo in Es (E♭),' in the overture to his 'Fall of Babylon,' and in his overture to 'Jessonda' he has two piccoli in D♭ in the introduction. With these exceptions, the piccoli in D flat and E flat are, we believe, exclusively to be found in music for military bands.

226. The Flageolet, the survivor of the old Flûte-à-bec, is never used in the ordinary orchestra, though we believe it is still occasionally to be found in quadrille bands. We only mention it here because Mozart in his 'Entführung aus dem Serail' wrote a part for the Flageolet in G, sounding a twelfth higher than the notes actually written. In the later editions of the score, the part is transposed for the ordinary piccolo, on which instrument it is always played in modern performances of the opera.

CHAPTER VII.

WIND INSTRUMENTS: DOUBLE-REED INSTRUMENTS.

227. The various reed instruments, of which we have now to treat, occupy a more important position in the orchestra than the family of flutes spoken of in the last chapter. While the flutes are exclusively soprano instruments, the different kinds of "reeds" (as reed instruments are frequently called,) extend, like the strings, over the whole compass of the orchestra except the extremely high notes which can only be obtained from the piccolo. Moreover they are much more varied in their tone-qualities than the flutes, and are capable of more expression, the various gradations of sound, from *pp* to *ff* being more readily produced.

228. The greater expressive power of this family of instruments arises from the fact that the air in their tubes is set in motion by means of a *reed* placed in the mouth of the player. There are two kinds of reeds, double and single; in this chapter we shall speak of the instruments played by means of the former.

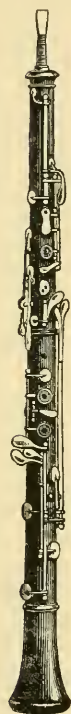
229. The double reed consists of two thin slips of cane, placed one against the other, so as to leave between them a very narrow orifice for the passage of the air. These two pieces of cane are fastened by means of silk to one end of a thin brass tube called the staple, the other end of which is inserted in the upper end of the tube of the instrument to be played. The size of the reed varies according to the size and pitch of the instrument to which it belongs, an oboe reed being very much smaller than that of a bassoon. The player takes the reed a little way into his mouth, presses the two edges between his lips, and, on blowing through them, sets in vibration the column of air in the tube of the instrument.

230. Many varieties of double-reed instruments have been used at different periods; at the present time only four are employed in the orchestra, all of which have conical tubes, which, however, differ from that of the flute, in that they enlarge, instead of diminishing, toward their lower end. The four instruments at present in use are the oboe, the cor anglais, the bassoon, and the double-bassoon, or contrafagotto.

THE OBOE.

231. The Oboe (*English* Hautboy,—formerly also 'Hoboy,' —*Fr.* Hautbois, *Ger.* Hoboe,) is the treble of the family of

double-reed instruments. Music for it is always written in the G clef, and the compass of the instrument extends from [music] to [music]. Oboes of French manufacture



THE OBOE.

have an additional key, extending the lower compass of the instrument to B♭; but this note, though employed by Mendelssohn in the Intermezzo of the 'Midsummer Night's Dream,' had better be avoided by students, as it is not on all instruments.

232. The fingering of the oboe has much general resemblance to that of the flute (§§193–195), though, owing to the different arrangement of the keys, it varies in many details. The natural scale of the instrument,—that is, the scale obtained by opening in succession the holes covered by the fingers, without touching any of the keys, is that of D major. The lowest notes, B, C, and C♯, are produced by closing, by means of keys, holes pierced in the lower part of the tube, and the fundamental notes of the instrument extend from [music] to [music], with all the intermediate semitones. As with the flutes, the next octave of notes (from D to C♯,) is obtained by increased wind pressure, causing the tube to sound its second upper-partial, the highest notes being produced by cross-fingerings. It will be well not to use the upper F, as the note is difficult to obtain, and is not of very good quality.

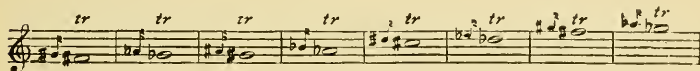
233. The lowest notes of the oboe have a somewhat harsh, nasal quality, excellent for certain dramatic effects, but difficult to soften. The best part of the instrument is the medium register, lying approximately between [music] and [music]. Though not very powerful, the tone is extremely penetrating, and of a very reedy quality. The upper notes are thin and rather piercing.

234. It is worthy of mention that the tone of the oboe in the last century, as used by Bach and Handel, differed essentially from that of the modern instrument. At that time the reeds used were much broader than those of the present day, the result being that the tone, instead of being, as now, like a silver thread in the orchestra, was fuller and more nasal, not unlike the *musettes* that are to be heard sometimes in the streets, associated with the Tyrolese bagpipes. Even at the

present time broader reeds are used in Germany than in England or France, and the tone of the German oboe is accordingly less agreeable to our ears, accustomed to a different quality.

235. Though all keys are practicable on the oboe, those which contain many sharps or flats in the signature are, as with most other keyed wind instruments, more difficult than others. It is therefore inexpedient to write very florid passages in extreme keys. It may be said in general terms that florid passages, even when not difficult to play, are mostly not very effective. The oboe is in character essentially an expressive and melodic instrument, and the most suitable methods of employing it will be best understood by examining and comparing the examples presently to be given from the works of the great masters.

236. Most shakes are practicable on the oboe ; those which should be avoided are those below and above as well as the following, all of which, it will be seen, contain two sharp or two flat notes :—



237. Owing to the smallness of the reed of the oboe, the instrument requires very little wind to play it, so little, in fact, that the player, while blowing, can never fully let out the breath he has taken into his lungs. This soon becomes fatiguing, and even painful, and it is therefore very necessary in writing for this instrument to give frequent rests in the parts, so as to allow the performer to breathe freely. In modern scores this point generally receives proper attention, but the older composers were sometimes very thoughtless in the matter. Bach, especially, has written in some of his works solo passages for the oboe which are so long as to be almost impracticable.*

238. Owing to its expressive and incisive quality of tone, the oboe has always been a favourite instrument for solo passages in the orchestra. It will suffice to remind the student of such familiar examples as the oboe solos in Beethoven's 'Eroica' symphony (Funeral March and Finale), in the first

* Even more recent composers are not always free from reproach in this matter. Schumann, in the second of his 'Three Romances for Oboe with Piano,' Op. 94, has written a passage of eighty-four bars for the instrument without even a quaver's rest ; and a very eminent oboe player, the late M. Dubrucq, once told the author that he always refused to introduce the piece at concerts, as it was quite impossible to play.

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movement of the symphony in A, and the scherzos of the Pastoral and Choral Symphonies. Schubert in the Andante of his great symphony in C, and Mendelssohn in the *allegretto* of the symphony to the 'Lobgesang (see within, Ex. 111,) have also written solo passages for the instrument which every one will (or ought to) know. We prefer to quote extracts which the student is less likely to have seen.

239. Our first example is by Gluck, in whose scores will be found many beautiful and expressive solos for the oboe.

Ex. 92. GLUCK: 'Iphigénie en Aulide.'

Allegro moderato.

Oboe *Solo.*

Viol. 1, 2.

Viola.

Bassi.

240. In our next illustration

Ex. 93. HUMMEL: Mass in E flat.

Larghetto.

Solo.

Oboe.

Viol. 1, 2.
Viola.

pizz.

Bassi.



we have, to save space, condensed the three upper string parts on one staff. The long holding notes for the oboe are here very telling.

241. One of the most effective solos for the oboe ever written will be seen in the opening symphony of the air "For my soul thirsteth for God," from Mendelssohn's 42nd Psalm.

Ex. 94. **Mendelssohn: 42nd Psalm.**

Adagio.

Oboe *Solo.*

Viol. 1°

Viol. 2do.

Viola.

V'c.

V'cello e Basso.

p

sf

cresc.

Bassi.

pp *pp* *pp* *cresc.* *pp* Bassi.

Notice that the whole passage lies in the best part of the compass of the instrument. Observe also the judicious way in which the accompaniment is laid out for the strings, and the effect obtained by the entry of the double-basses at the eighth bar for a few notes only.

242. It will be seen that all the examples hitherto given have been in minor keys. Such are especially well suited to the oboe, the most plaintive instrument in the orchestra ; but its employment is by no means restricted to such passages. Our next illustration, from Mozart's incidental music to 'Thamos, King of Egypt' shows us a graceful and noble melody, elegantly accompanied.

Ex. 95.

Andante. MOZART : 'Thamos.'

Oboi. *p*

Fagotti. *p* *p*

Viol. 1º con sord. *p*

Viol. 2do con sord. pizz. *p*

Viola. pizz. *p*

Bassi. *p*

The echoing of the oboe by the bassoons in the second and fourth bars has some analogy to the effect seen in Ex. 83. Observe also the contrasts in the string parts, the second violins and violas being *pizzicato*, while the first violins and basses are played with the bow.

243. Though the oboe, in the hands of a good player, is quite capable of rapid execution, it is comparatively seldom that florid solos are assigned to it. One of the best known of these is to be seen in the third Entr'acte of Beethoven's 'Egmont' music. As this has been frequently quoted in other books on orchestration, we prefer to give a less familiar example.

Ex. 96. CHERUBINI : 'Eliza.'

Cantabile.

Oboe Solo. p

Viol. 1, 2. Viol. 1o. pp

Viola. Bassi. (Viola col Basso.) pizz.

V. 2do

tr

Here nearly the entire compass of the oboe is employed. At the end of the passage Cherubini has written the high F, a somewhat risky note, but easier if approached in a scale passage, as here, than in any other way. The violas are here marked 'col Basso.' Here is an example of what was mentioned in § 114; the violas in such cases mostly play in octaves (not in unison,) with the basses.

244. We now give some examples of more lively solos for the oboe. Our first illustrates the use of the *staccato*.

Ex. 97. AUBER: 'La Muette de Portici.'

Allegretto. stac.

Oboe *Solo.*

Viol. 1, 2. pizz.

Viola. pizz.

Bassi. V'celli. pizz. Bassi.

It must be remembered that such an effect as the above is only practicable on the oboe at a moderate speed. This is because the 'double-tongueing' by which rapid iterated notes can be obtained on the flute (§ 199,) is impossible on a reed instrument, as the reed is in the player's mouth. But in an *allegretto* passage, as here, it is not only easy but very effective.

245. Our next example

Ex. 98. SPOHR: 'Jessonda.'

Vivace.

Oboe *Solo.* *dolce.*

Viol. 1, 2.

(Viola *tacet.*)

Viola. Bassi.

Viola.

unis.

Bassi.

is somewhat similar in character to the preceding, but mostly *legato* instead of staccato.

246. The first subject of the finale of Raff's fourth symphony

Ex. 99. RAFF: 4th Symphony.

Vivace.

Flauto 1° *p*

&c.

Oboe 1° *p*

offers an interesting example of a solo of a pastoral and rustic character with the lightest possible accompaniment—only a holding note for the flute above. Later in the movement the subject is repeated with fuller harmony.

247. The combination of the lower notes of the oboe with soft chords for the trombones was a discovery of Schubert's.

Ex. 100. SCHUBERT: Mass in E flat.

Moderato.

Oboe 1° *p*

Fagotti. *p*

3 Tromboni. *p*

Notice here that the rests above (not below,) the notes for the bassoon show that the part is to be played by the *second* bassoon, not the first.

248. In all the examples hitherto given the melody has been allotted to the oboe; but it is also very frequently used to fill up the harmony. We have seen one instance of this in Ex. 80, and many others will be met with later in this work. For our last illustration we give a charming passage from the first act of 'Le Philtre,' showing four-part harmony for two flutes and two oboes.

Ex. 101. AUBER: 'Le Philtre.'

Andantino.

Flauti. *p*

Oboi. *p*

249. In addition to the ordinary oboe, other varieties were formerly in use. In Handel's opera 'Flavio' there is a song, "Amor, nel mio penar," in the key of B flat minor, which contains an *obligato* part for the oboe, written in A minor. The inference is that there must have been an oboe a semitone higher in pitch than that in ordinary use, like the flute in D flat spoken of in § 212. Much more frequently employed was the OBOE D'AMORE. This was an oboe a minor third lower in pitch than the ordinary instrument, like the clarinet in A of which we shall speak in the next chapter. The tone was softer and somewhat more veiled than that of the usual instrument, being intermediate in quality, as well as in pitch, between the oboe and the cor anglais, of which we shall speak next. As its natural scale was that of B♮ major, it was almost exclusively used in sharp keys. Bach, who frequently used the

instrument, wrote for it in two ways. Sometimes he wrote the actual notes to be sounded, as in the Christmas Oratorio, the Mass in B minor, and the Passion according to Matthew; at other times (as in the 'Magnificat,') he treats it as a transposing instrument, writing the notes a minor third higher than they sound. The latter is certainly preferable, for the reasons already given in § 214. Inasmuch as the scores of Bach we have named are readily accessible to the student,* we prefer to give an example which will certainly not be familiar, as Graun's 'Passion,' from which it is taken, is unpublished.

Ex. 102.
Larghetto GRAUN: Passions Musik.

Oboe d'Amore. *p*
Viol. 1º. *p*
Viol. 2do. *p*
Viola. *p*
Bassi. pizz.

* They are all published in the Peters edition.



Here the *oboe d'amore* is written as a transposing instrument, and the part must be read in E, a minor third lower. The simplest way for the student will be to imagine the soprano clef (clef) at the beginning of the line. The tender, flowing melody suits the genius of the instrument admirably; the student should also notice the ingenious manner in which the accompaniment is divided among the strings. The figures over the bass line show that the harmony was also to be played on the organ ; in the passage immediately following our extract '*senza Organo*' is marked in the score. At the time (about 1730,) at which the work was written it was not customary to write the organ parts in full ; the player was expected to fill them up from a figured bass. This method is now completely obsolete.



THE COR ANGLAIS.

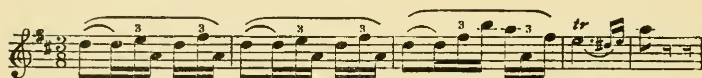
THE COR ANGLAIS.

250. The Cor Anglais (*Ital.* Corno Inglese, *Ger.* Englisches Horn,) is not, as its name would seem to imply, a horn at all, but a larger-sized oboe —the alto, in fact, of the usual instrument. Its fingering is identical with that of the oboe, but, its tube being longer by one half, its pitch is a perfect fifth lower, from (E (E♭)) to (C), with all the intermediate semitones. The instrument is an improved and modernized form of the old *Oboe da Caccia*, frequently to be found in the scores of J. S. Bach.

251. More than one method of notation has been at different times adopted by composers. The older French composers, when they used the instrument, wrote the notes actually sounded, but employed the mezzo soprano clef ( ); the player had only to think of his part in the G clef to find the proper fingering. Bach always writes for the Oboe da Caccia in the alto clef at the real pitch. The Italian composers before Verdi adopted a curious and absurd method. They wrote the part for the Cor Anglais in the bass clef, and an octave lower than the real sounds. A familiar example of this is the solo for the cor anglais in Rossini's overture to 'Guillaume Tell,' which in the score is printed thus—



The notation now universally adopted, and by far the best, is to treat the cor anglais as a transposing instrument, and to write for it strictly according to the fingering. The reason for this is, that in the orchestra it is always played by one of the oboists, who is thus spared the labour of transposing his part a fifth higher. The passage from 'Guillaume Tell' quoted above should therefore be written



A moment's thought will show the student that the key-signature of the cor anglais will always contain one sharp more, or one flat less, than that in which the music really stands.

252. The tone of the cor anglais is nearly homogeneous throughout its whole compass. It is absolutely devoid of brilliancy, and is less piercing than that of the oboe; but it has a peculiar melancholy and sombre character that no other instrument can replace. Its lower notes are very rich and full, and altogether free from the coarseness characterizing the corresponding notes of the oboe, and the highest notes are seldom employed. The most effective part of the instrument is that lying below the G above the staff—sounding of course a fifth lower.

253. The older masters seldom employed the cor anglais, though Gluck has introduced two in the air "Plein de trouble et d'effroi," in the first act of 'Orphée.' But the usually most accurate M. Gevaert has made a slip when he says in his

'Instrumentation' that neither Haydn nor Mozart made use of the instrument. Haydn employs it in his 'Stabat Mater' and his Mass in E flat, and Mozart has parts for two *corni inglesi* in two of his Divertimenti for wind instruments, and in his operas 'La Finta Semplice' and 'Il Re Pastore.'* But neither Beethoven, Schubert, Weber nor Mendelssohn ever introduced the instrument into their scores, and Schumann only once—in his 'Manfred' music, which contains a long passage, entirely unaccompanied, intended to represent an Alpine 'Ranz des Vaches.' The solo is so admirably suited to the instrument that we quote the first bars—

Ex. 104. SCHUMANN: 'Manfred.'

Nicht schnell. (Echo.)

Cor Anglais. *p* *pp* *p*

(Echo.) *pp* *cresc.* &c.

254. The first modern composer to bring the cor anglais into prominence was Meyerbeer, in whose scores it often plays an important part. We give an extract from the well-known song "Robert, toi que j'aime," in which the voice is accompanied only by harp and cor anglais, the wind instrument echoing the voice in a most effective manner.

Ex. 105. MEYERBEER: 'Robert le Diable.

Poco andantino.

Cor Anglais. *p*

Harp. *p* *pp*

ISABELLE. Quoi! ton cœur,

* In the song "Senti l'eco" of 'La Finta Semplice, Mozart has, quite exceptionally, written the corni inglesi as non-transposing instruments in the G clef.

Quoi ! ton cœur se - - - - dé - ga - - - ge

imitando la voce.

Des serments les plus doux, des ser - ments......... les plus

cresc.

dolce.

&c

doux? Tu me rendis hom-mag-e, Je suis à tes ge- noux.

The score contains also a part for a second harp ; but, as this only doubles in octaves the bass of the first harp for a few bars, we have omitted it to save space.

255. Our next example is from Berlioz's 'Faust.'

Ex. 106. BERLIOZ: 'La Damnation de Faust.'

Andante un poco lento.

Cor Anglais. *p*

Viol. 2do *pp*

Viola. *pp*

V'celli. *pp*

poco riten.

div.

&c.

Here the solo is accompanied only by quiet sustained chords on the strings.

256. Somewhat similar in effect, though the accompaniment is even more quiet, is the opening theme of the Largo of Dvořák's fifth symphony.

Ex. 107. DVOŘÁK: 5th Symphony. ('From the New World.')

Largo.

Cor Anglais. *p*

Viol. 1, 2. con sordini. *ppp*

Viola. con sordini. *div.* *ppp*

V'cello. con sordini. *div.* *ppp*

The student should notice that all the three passages last given would be *possible* on the oboe, as the lower notes of the cor anglais are not employed; but the effect would have been far less, as the oboe would have only imperfectly given that peculiar melancholy tinge to the music which is one of the special characteristics of the tone of the cor anglais.

257. We said above that the cor anglais was always played by one of the oboists in the orchestra. In general, when a part for the instrument is written, there will only be one oboe in the score, and the student will do well to remember this. Wagner, however, in his latter works, as already mentioned (§43), employs three of each kind of wind instrument, and his example has occasionally been followed by others. But if the student writes extra parts in his score, he will greatly diminish the chances of getting his work performed; he will therefore be wise only to write for the instruments in ordinary use.

258. Our last example for the cor anglais is instructive in more than one respect (Ex. 108). Notice first that this passage begins in B major and modulates to D sharp minor. The keys for the cor anglais would therefore (§251,) be F sharp major and A sharp minor. But, in the case of extreme keys, it is more usual to write instead of sharp keys the flat keys which are their enharmonic synonyms, as being considered easier to read. M. Gevaert, in his admirable work already referred to, quotes a cor anglais solo from Ambroise Thomas' 'Hamlet,' in the key of C sharp minor, in

Ex. 108. WAGNER: 'Die Walküre.'

Cor Anglais. *p espress.* *cres - - cen - - do.*

Fagotto 1° *pp* *cres - - cen - - do.*

Viol. 1° *trem.* *pp*

Viol. 2do *trem.* *pp*

Viola. *trem.* *pp*

V'cello. *trem.* *pp*

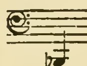
which, for the reason just given, the part is written in A flat minor instead of G sharp minor. Another point to be remarked in the passage now under notice is, that the cor anglais is doubled in the octave below by the bassoon, and that Wagner intends the melody in the lower octave to be less prominent than in the upper. The cor anglais begins *p*, the bassoon *pp*, and the crescendo rises at the fifth bar to *f* for the former instrument, and only to *mf* for the latter. Such refinements of nuance are peculiar to modern scores.

259. One word in conclusion with regard to this instrument. It is almost exclusively used, as in the examples we have given, for sustained melodies. Rapid passages, it is true, are quite practicable upon it, but they are unsuited to its character, and therefore ineffective.

THE BASSOON.

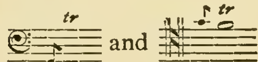
260. The BASSOON (*Fr.* Basson, *Ital.* Fagotto, *Ger.* Fagott,) is the bass of the oboe family. Its conical tube is about nine feet in length, but, for the convenience of handling, it is doubled on itself, as seen in the accompanying cut. Hence its Italian name, 'Fagotto'—from its resemblance to a faggot. It is played with a double reed, considerably larger and broader than that of the oboe, and this reed, instead of being inserted in the end of the tube, (which, from the shape of the instrument, would not be possible,) is connected with it by means of a brass crook.

261. In its general plan, the fingering of the bassoon resembles that of the oboe, its natural scale being that of G major. By a prolongation of the lowest joint of the tube, to which several keys are attached, the downward compass of the instrument is extended to



. The fundamental tones therefore embrace the notes from this B flat to . As with the flute, oboe, and cor anglais, the next octave is obtained by increasing the pressure of the wind so that the tube gives its second upper partials, while still higher notes (Nos. 3, 4, or 5 of the harmonic series,) can be obtained by means of cross-fingerings. The compass of the instrument for orchestral purposes is from to ; for solos a few still higher notes are possible. Music for the bassoon is written in the F clef for the lower and medium notes, and in the tenor clef for the higher part of its compass.

262. All keys are practicable for the bassoon, but it will be well, as with most other wind instruments, to avoid rapid passages in extreme keys. It must also be remembered that, owing to the fingering, the rapid alternation of the notes F♯ G♯ (G♭ A♭) in *any* octave is difficult. All shakes are possible between

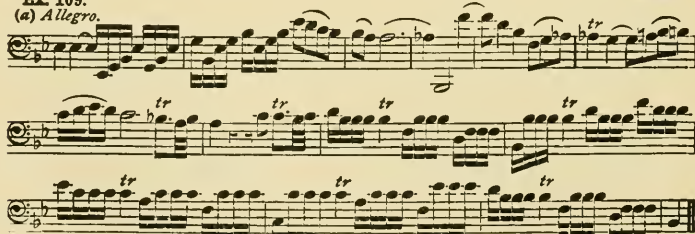


, except those on the two notes just named.

THE BASSOON.

263. The bassoon is capable of very considerable execution. As examples of effective and rapid passages of various kinds we give the following, from Mozart's concerto for the instrument:—

Ex. 109. MOZART: Concerto for Bassoon.



* Wagner in his 'Ring des Nibelungen' has written the A, a semitone lower, for the bassoon; but this note is hardly ever to be found on the instrument.



Large skips, such as those seen in the fourth bar of (*a*) and the third bar of (*b*), present no difficulty and are of excellent effect.

264. It is not, however, chiefly for rapid passages, such as the above, that the bassoon is useful in the orchestra. Owing to its extensive compass, which exceeds that of any other wind instrument except the clarinet, it is capable of the most varied employment. It furnishes the bass of the wind instruments when used as a separate mass ; the lower octave is of a strongly marked reedy quality, rather powerful and difficult to subdue ; the medium octave is weaker, but penetrating in tone, and often very effective for doubling other instruments in the octave below ; while the higher register has some affinity of quality to the violoncello, partaking also somewhat of the timbre of the tenor voice. The various methods of treating the instrument will be best understood by carefully examining the numerous examples which it will now be necessary to give.

265. Our first illustration is one of the finest solo passages ever written for the bassoon, extending, as will be seen, through its entire compass.

Ex. 110.
Andantino. CHERUBINI : 'Médée.'

Fagotto. *p*
Viol. 1, 2. divisi. *p*
Viola. *p*
Bassi. pizz.

tr

unis.

arco.

pizz.



In the sixth bar from the end of this quotation will be seen the upper C—the note above the B♭, named in §261 as the highest in ordinary use. In solos such as this, the extreme notes of the instrument are sometimes employed. It will be noticed that the greater part of the passage lies in the tenor octave, the most expressive part of the bassoon's compass.

266. The bassoon is frequently used to double in the lower octave a solo passage played by some other instrument—sometimes the violins, more frequently a wind instrument, as in the following familiar example.

Ex. 111. MENDELSSOHN: 'Lobgesang.'

Oboe 1º. *p* *cresc.*

Fagotto 1º. *p* *cresc.*

Viol. 1, 2. pizz.

Viola. Bassi. pizz. *cresc.* *p* pizz.

sf *dim.* *p*

sf *dim.*

p

267. No composer understood the resources of the bassoon more thoroughly than Haydn, whose scores abound in charming passages written for that instrument. Let the student carefully examine the following example, and notice how much effect is here obtained by very simple means.

Ex. 112. HAYDN: 'Creation.

Moderato.

Fagotto 1º

Viol. 1º

Viol. 2do

Viola.

GABRIEL.

Bassi.

bright, Their nar-row sin-uous veins dis- - til in crys-tal drops the foun - tain fresh and bright.

Fag. 2do

&c.

268. In our next quotation is seen a different employment of the bassoons.

Ex. 113. Mozart: Symphony in G minor, No. 25

Andante.

Here a very charming effect is produced by the two bassoons imitating freely the subject announced by the muted violins.

269. In the Romance in the first act of 'Euryanthe' Weber has ingeniously accompanied the tenor voice by the combination of two violoncellos and two bassoons.

Ex. 114. Weber: 'Euryanthe.'

Andante con moto.

strand, gab der rein-sten Lie-be ger - ne An-gen-stern ein Himmels-pfand.

Notice here that the *rôles* of the instruments are exchanged in the second half of this passage. For the first four bars the bass of the harmony is given to the second bassoon, and the melody to the first violoncello; while at the fifth bar the first bassoon takes the melody, and the second violoncello the bass.

270. When wind instruments are employed alone, the bassoon forms the usual and natural bass, as in the following passage:— Ex. 115. SPONTINI: 'Fernand Cortez.'

Allegro vivace.

Flauti.

Oboi.

Clarinetti.

Fagotti. unis.

Corni in D. (sounding a minor 7th lower.)

Sometimes the bass is allotted, as here, to the two bassoons in unison, sometimes only to one, while the other is either silent, or sustains another part of the harmony. A very familiar example of this treatment of the bassoons is furnished by the opening bars of the overture to 'Tannhäuser.'

271. Our next illustration

Beethoven: 4th Symphony.

Ex. 116.

Allegro vivace.

1 Flauto.
2 Oboi.
2 Fagotti.
Viol. 1, 2.
Viola.
Bassi.

p *sempre p*

p

pp

pp

pp

shows a lively solo for the bassoon, imitated first by the oboe and then by the flute ; it also shows in the last four bars a very frequent and effective employment of the instrument. Two bassoons here fill up and sustain the middle harmonies, as the oboes had done in the four bars immediately preceding.

272. The *staccato* of the bassoon is very often used, and mostly with very happy effect. A good example is found in the movement from which we have last quoted.

Ex. 117. Beethoven : 4th Symphony.

Oboi. *pp*

Clarinetti in B. (sounding a tone lower.) 1º *pp*

Fagotti. a 2. *pp* stacc.

Corni in B. (sounding a major 9th lower.) *pp*

Viol. 1, 2. Vº 1º *pp*

Viola. *pp*

Bassi. pizz. *pp*

&c.

V° 2do *pp*

This passage is played by the two bassoons in unison. When two wind instruments, the parts for which are written on the same staff, are to play in unison, this is indicated either by writing '*unis*' (the abbreviation of '*unisoni*,') over the notes, or by writing, as here '*a 2*' (*a due*), which means that the part is to be played by both instruments. (See §223.)

273. Our next example illustrates a staccato of a different kind.

AUBER: 'Le Maçon.'

Ex. 118.

Allegro.

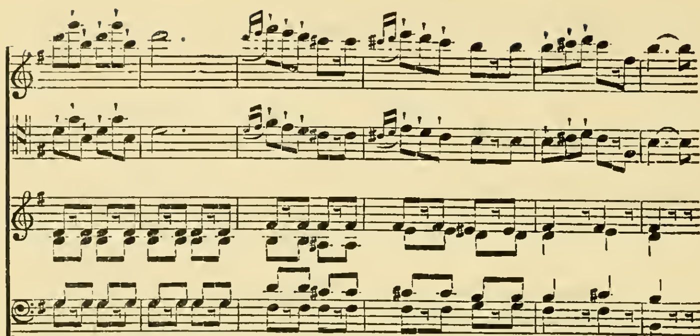
Flauto *Solo.*

Fagotto *Solo.*

Viol. 1, 2.

Viola.
Bassi.

p



Instead of merely accompanying, the bassoon here doubles the flute in the fifteenth with the first subject of the *allegro.*

274. Though in general only two bassoons are used in the orchestra, Wagner, in most of his later works, employs three, and in modern French scores four are often to be met with. Three have already been seen in Ex. 44 ; we now give a very characteristic passage in which a bass solo is accompanied by four bassoons.

Ex. 119. BERLIOZ: 'La Damnation de Faust.'

Allegro.

Fl.

Flauti.
Oboi.

Ob.

Fagotti 1, 2.

Fagotti 3, 4.

pizz.

Violini 1, 2.
Viola.

BRANDER.

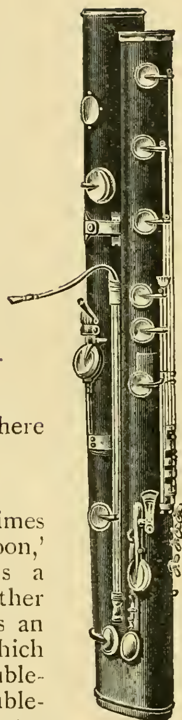
Cer - tain rat dans u - ne cui- sine é - ta -

V'celli.

Fl. Ob.

· bli comme un vrai fra - ter,

To save space, the three upper string parts are here condensed on one staff.

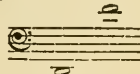


THE CONTRA-FAGOTTO.*

THE CONTRAFAGOTTO.

275. The CONTRAFAGOTTO (*Ital.*), sometimes called by its English name 'Double Bassoon,' (*Fr.* Contre-Basson, *Ger.* Contrafagott,) is a bassoon of a larger size, the tube being rather more than 16 feet in length. In pitch it is an octave below the ordinary bassoon, to which it bears the same relation that the double-bass does to the violoncello. Like the double-bass, it is a transposing instrument, the notes being written an octave higher than they sound, to avoid many leger lines.

276. Formerly contrafagotti were made to go down to the B♭, the octave below the lowest note of the bassoon (see § 261), and this note is actually written for the instrument by Beethoven in the finale of the 9th symphony. But these extremely low notes were not only difficult to obtain, but of bad quality, and most newer instruments do not possess them.

The available compass of the contrafagotto is 

(sounding, it must be remembered, an octave lower). A few higher notes are possible, but quite useless, as the same can be played with much better effect on the ordinary bassoon.

277. Owing to the great length of the tube, very rapid passages are impossible on this instrument, though Beethoven

* From Grove's 'Dictionary of Music,' by permission of Messrs. Macmillan & Co.

has written such in his 9th symphony. Here, however, the contrafagotto is not *obligato*, but simply plays in unison with the double-basses, and it is doubtful whether the effect is ever entirely satisfactory.

278. The contrafagotto is not a new instrument. Handel employed it in his 'L'Allegro,' and in the 'Firework Music,' and Haydn uses it in the 'Creation,' 'Seasons,' and 'Passione.' Mozart gives to it the lowest part in his Serenade for thirteen wind instruments, and in his 'Maurerische Trauermusik,' but in the latter work it is *ad libitum*, and in the former it has seldom an independent part, mostly doubling some other instrument in the lower octave. Beethoven in his fifth and ninth symphonies and in his Mass in D, introduces it, but generally only to strengthen the basses. The finest instance of its employment by this composer is in the great duet in the second act of 'Fidelio.' Of more recent composers, Mendelssohn and Brahms have made effective use of the instrument, the former in the 'Meeresstille' overture, and the latter in his first symphony, and the 'Gesang der Parzen,' while Wagner in the 'Ring des Nibelungen' prescribes that the low A, which he frequently gives to the third bassoon (§261, *note*), shall, if the note is not on the instrument, be played on a contrafagotto. In his 'Parsifal' he has written a separate part for the instrument, treating it as non-transposing, and writing the notes at their real pitch.

279. As the contrafagotto never forms an integral part of the ordinary orchestra, the student is recommended not to introduce it into his scores—or, at any rate, not to write an *obligato* part for it. For the sake of completeness, we give two examples of its employment by the great masters. The first is a well-known passage by Haydn.

Ex. 120. *Maestoso.* HAYDN: 'Creation.

Fagotti e Contrafagotto. *unis.*
Viol. 1º
Viol. 2do
Viola.
RAPHAEL.
By hea - vy beasts the ground is trod,
Bassi.

by hea - - vy beasts the ground is trod.

Every one who has heard the 'Creation' will remember the effect of this little piece of musical painting, with the entry *fortissimo* of the two bassoons and the contrafagotto on the word "trod." Here, again, we see the lowest B flat written for the contrafagotto; but in actual performance it only sounds the note written, not the octave below.

280. Our second example, taken from Spohr's beautiful, though little known, Notturno for wind instruments only,

Ex. 121.

Allegro. SPOHR: Notturno, Op. 34.

Clarinetti in B. (sounding a tone lower.)

Corni in E♭. (sounding a major 6th lower.)

Fagotti.

Contrafagotto.

pp

&c.

is very different. Here the real bass of the harmony is given to the contrafagotto alone, *pp*. It is not often that the instrument is employed in this manner ; in most cases it simply reinforces the bass of the harmony by playing in unison with the double-basses.

CHAPTER VIII.

WIND INSTRUMENTS: SINGLE-REED INSTRUMENTS.

281. The "single reed," the employment of which, for the production of the tone, distinguishes the instruments now to be spoken of from those dealt with in the last chapter, is a broad strip of reed, or cane, narrowing at the upper part to an extremely fine edge, and attached by small screws to the lower side of a mouthpiece, generally made either of wood or of ebonite, in such a way as to leave a small gap for the passage of the air. The reed is pressed against the lower lip of the player, and set in vibration by his breath. The vibrations of the reed put in motion the column of air in the body of the instrument, as with the oboe, &c., and thus produce the tone.

282. Only two families of single-reed instruments are used in the orchestra—the clarinets and the saxophones; and of these the employment of the latter is quite exceptional, and is mostly confined to military bands. The clarinet, on the other hand, is one of the most important, as well as most frequently used, of all wind instruments. We shall therefore deal with it first.

THE CLARINET.

283. The CLARINET (*Ital.* Clarinetto, *Fr.* and *Ger.* Clarinette,—in German also 'Klarinette,') is an instrument which differs from all other reed instruments in that its tube, excepting the bell at the end, is cylindrical, while all others are conical. This, as we shall see directly, makes a very important difference in the mechanism and fingering of the instrument. The name, originally Italian, is a diminutive of the word '*clarino*,' a trumpet, and was given to it because the brilliancy of its upper register was thought to have some affinity to the trumpet tone.*

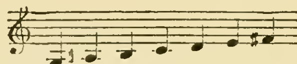


THE CLARINET.

* The author desires here to enter an emphatic protest against the common, but quite indefensible spelling of the name of the instrument as "clarionet." It has nothing whatever to do with the English word "clarion."

284. It is a very curious fact that a cylindrical tube, the air in which is set in motion by a reed, corresponds to a stopped pipe in an organ: that is to say, it produces a note an octave lower than would be sounded by an open pipe of the same length.* Thus, on the oboe the note [musical note] is obtained from a tube two feet in length, while the same note is produced on the clarinet with only one foot of tube. Besides this, stopped pipes only give the *uneven* upper-partials of their tube (Nos. 3, 5, 7, &c.); this causes the fingering of the clarinet to be quite different from that of the oboe or bassoon.

285. Like the flute, oboe, and bassoon, the clarinet has six holes in its tube, which are closed by the first three fingers of each hand; it has also a hole at the back, which is covered by the left thumb of the player, while various other holes are controlled, as in other wind instruments, by keys. The natural fundamental scale of the instrument, obtained by opening successively the six holes covered by the fingers, is that of G major, a fifth lower than the corresponding scale of the flute and oboe.

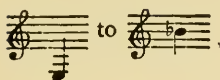


As on the oboe (§ 232), three semitones lower are obtained by means of keys closing holes in the lower part of the tube; the compass of the clarinet is thus extended downwards to [musical note]

286. Thus far the fingering of the clarinet corresponds to that of the other wind instruments we have described; but in the next notes we come to, we find a very important difference. It was said above that a cylindrical tube gives only its uneven upper-partials; consequently we cannot obtain the next octave from G to F♯ with the same fingering as the lower one. The first upper-partial obtainable is No. 3 of the series—the twelfth of the fundamental tone; and the twelfth of the lowest E is B♮ ([musical note]). This leaves four semitones above the F♯ before the upper series begins. Of these G is obtained by lifting all the fingers from the holes, and raising the left thumb from the thumb hole, while G♯ (A♭), A♮, and A♯ (B♭) are produced by opening, with the thumb or first finger of the left hand, keys in the upper part of the instrument near the mouthpiece. The

* See Sedley Taylor's *Sound and Music*, Chap. v.

fundamental scale of the clarinet therefore extends from



, with all the intermediate semitones, obtained (as on other instruments,) by means of keys. As the second series of notes is a twelfth, and not an octave, higher than the first, it follows that the same fingering which produces the notes



will also give the notes



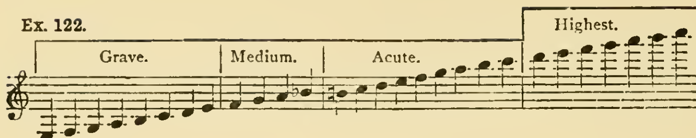
the only difference being that for the upper series the left thumb, while closing the thumb hole, has also to open a key placed close to it, which helps the production of the upper notes. The highest notes of the instrument are obtained by 'cross fingerings,' and the compass of the clarinet, for orchestral purposes, extends to or even to . In solo music a few notes above this are possible ; the extreme limit of the instrument being to C *in altissimo*.

287. We have entered in some detail into the fingering of the clarinet, because it is very desirable that the student should know something about it in order to be able to write effectively for the instrument. It will be seen that its entire compass is even more extensive than that of the bassoon, and there is evidence that in the last century clarinets were in existence which went down to the lower C, a major third below the E given above as the lowest note. Mozart in the air "Parto, ma tu, ben mio" in 'La Clemenza di Tito,' has written an important *obligato* for the clarinet in which the low C and D are repeatedly used ; but these notes are never to be found on modern instruments.

288. Music for the clarinet is almost invariably written in the G clef, though Wagner exceptionally writes the lower notes in the F clef, to save leger lines. An example may be seen by those who are curious in the matter on p. 22 of the full score of 'Die Walküre.'

289. The quality of tone of the clarinet varies greatly in the different registers, which are thus divided :

Ex. 122.

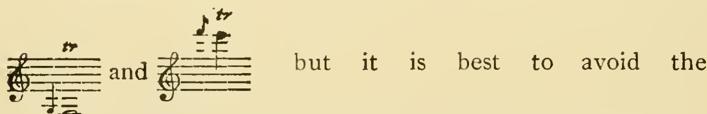


The lower register, often called the *Chalumeau*,* has a rich, mellow, and peculiarly reedy tone ; the medium register, from F to B flat, is rather dull and weak ; the acute register, obtained, as we have already seen, from the third upper partials, is full, round and clear, without harshness ; while the extreme upper register is of a piercing, cutting tone, which can seldom be used effectively.

290. Excepting in its very highest notes, no wind instrument possesses in the same degree as the clarinet the power of graduating its tone. Any *nuance* from *ff* to *pp* is possible upon it, and for this reason it is one of the most valuable members of the orchestral force.

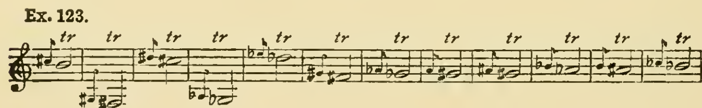
291. Owing to the greater complexity of its fingering, it is difficult on the clarinet to play any but simple passages in keys containing more than two, or at most three sharps or flats in the signature. For this reason, as will be seen directly, different kinds of clarinets are used in the orchestra. If it be necessary to write in an extreme key, a key with flats in the signature is mostly preferable to one with sharps. (Compare the notation of the cor anglais in Ex. 108.)

292. Most shakes are practicable on the clarinet between



but it is best to avoid the following, which are either difficult or altogether impossible.

Ex. 123.

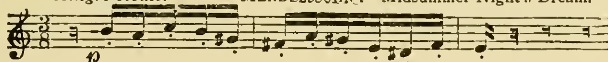


293. It will be seen that the last seven of the shakes here given are in the medium register of the instrument. The fingering of the clarinet renders rapid passages written entirely or chiefly in this register extremely difficult, and in some cases even impossible. For instance, the shake on G♯ with either A♮ or A♯ is quite impracticable, because the two

* The Chalumeau was a now obsolete wind instrument, the predecessor of the clarinet, and is to be found in some of the early Italian scores of Gluck.

notes are obtained by two different keys both of which are to be played by the first finger of the left hand, which obviously cannot move rapidly enough from the one key to the other. Probably one of the most difficult passages ever written for the clarinet is the short solo in the scherzo of Mendelssohn's 'Midsummer Night's Dream' music.

Ex. 124.

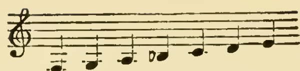


The difficulty here consists, not in the rapidity of the movement, for the clarinet is capable of considerable execution, but in the fact that the passage lies just in the 'break' of the instrument, where the upper series begins, and also that nearly every note below the B has to be played with the thumb or first finger of the left hand. If the passage had been written an octave higher it would have been comparatively quite easy. As it is in the key of E major, it further furnishes an example of what was said above (§ 291), as to the use of keys with many sharps or flats in the signature.

294. To obviate the difficulty just referred to, it has always been the custom to use clarinets of various pitches in the orchestra. Those in ordinary use are three in number, and are known as the clarinets in C, B flat, (generally called simply 'clarinet in B,') and A, respectively. Other varieties, which are only exceptionally employed, will be mentioned later. We have already met with transposing flutes (Chap. VI.); but, whereas these are not employed in the ordinary orchestra, the three varieties of clarinet just named are in constant use,* and we shall now show how they differ from one another, and under what circumstances it is advisable to use each.

295. It must be remembered that the mechanism and fingering of all the clarinets are identical; the only difference between them is in the length of their tubes, which of course makes a difference in pitch. When we said in §285 that the natural fundamental scale of the instrument was that of G major, we were speaking of the clarinet in C, the normal type, which is taken as the standard from which all the others are reckoned. When we speak of a clarinet 'in B flat' or 'in A,' we mean a clarinet on which, when the player fingers for C, the note actually sounded is B flat or A. In other words, the B flat is in pitch a tone lower, and the A clarinet a minor third lower, than that in C. Therefore the scale produced by successively raising the fingers from the holes of a B flat clarinet will be

* This statement is quite correct as regards the older masters; at the present day the C clarinet is much less frequently employed than those in B flat and A.



and of an A clarinet



The same relations of pitch of course hold good over the whole range of the instrument. Evidently the scale of C major played on a B clarinet—we shall henceforth adopt the shorter and more generally used name—will give the scale of B flat major, and the same scale played on an A clarinet will give the scale of A major.

296. Now let us carry our calculation one step further. The dominant key of C is G; therefore a part for the B clarinet written in the key of G will sound in the key of F, the dominant of B flat, while on the A clarinet, it will for the same reason sound in the key of E. Similarly, F being the subdominant of C, a clarinet part written in that key will sound, on the B or A clarinets, in E flat or D, the respective subdominants of those two keys. Other transpositions would be calculated in the same way.

297. The student will now see that, except with the extreme keys of F♯ (G♭) and C♯ (D♭), and their relative minors, it is always possible (though, as we shall show later, not always advisable,) to avoid having more than two sharps or flats in the signature of the clarinet. To assist him further in the matter, we give a complete table of signatures of all the keys, for each of the three clarinets in general use.

Ex. 125.

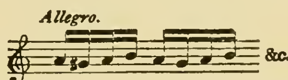
Clarinet in C.

Clarinet in B.

Clarinet in A.

By examining this table, the student will see that the signature for the B clarinet has always two sharps more, or (which comes to the same thing,) two flats fewer, and that for the A clarinet three flats more, or three sharps fewer, than the real key of the music, which would be that of the C clarinet.

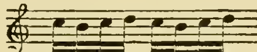
298. In speaking of the transposing flutes, we gave reasons (§ 214,) why it was advisable for the composer to write them as transposing instruments. The same arguments apply with at least equal force to the clarinets ; for a passage may be perfectly easy, or very nearly impossible, according to the instrument which the player is using at the time, and the composer is bound to consider this point. Supposing, for example, that he wants the following passage played on the clarinet :—



On the C clarinet this passage will be very uncomfortable (see § 293). If played on the B clarinet



it will be very little better ; but on the A clarinet it will be perfectly easy, because it does not come across the 'break' of the instrument at all.



299. As the B clarinet sounds a tone lower than written, the student must remember to write for it *a tone higher* than the notes he really requires, and, for a similar reason, he must write for the A clarinet *a minor third higher* than the notes really to be sounded. The passages given in the last paragraph illustrate this.

300. From the table of key-signatures given in Ex. 125, the student will see that the B clarinet is mostly used for flat keys and the A clarinet generally for those with sharps. But sometimes other considerations besides simplicity of signature influence the composer in his choice of the instrument to be employed. In the foot-note to § 294 we said that modern writers used the C clarinet less frequently than those in B and A. Each of the three clarinets has its special tone-quality. That in C is inferior in sweetness and richness to the other two, which is doubtless the reason that it is less frequently used in the present day. The B clarinet is the most brilliant, and is for that reason the one most generally chosen for solo display. On the other hand, the A clarinet, less brilliant than that in

B, has a peculiar tender sweetness, of which Mozart and Brahms have availed themselves in their clarinet quintetts, both of which are written for the A clarinet.

301. There are some keys for which more than one clarinet is available, such, for instance as C, G, F, and their relative minors. In such a case the composer will be guided partly by technical, but probably quite as much by æsthetic considerations. For example, Beethoven in the trio in the first act of 'Fidelio,' which is in the key of F, writes for C clarinets ; but in his Pastoral and eighth symphonies, both of which are in the same key, he uses clarinets in B. This may probably have been partly because the second movement of each symphony was in the key of B flat ; but it is likely also that he chose the latter instrument because of its superiority for solo passages ; the clarinet part in the 'Fidelio' trio is comparatively unimportant.

302. In his Scotch symphony, in A minor, Mendelssohn writes for A clarinets, though those in C would have required no sharps or flats in the signature. The part is of course written in C minor, an easier and more grateful key for the instrument than B minor, which would have been necessary had he written for B clarinets. We have already said that flat keys are mostly easier for keyed wind instruments than sharp ones.

303. It is possible to change a clarinet in the course of a movement, provided a few bars' rests are allowed the player for this purpose. This will mostly be for technical reasons, as in the case of the passage of Mendelssohn's 'Melusine' overture, where the player takes his C clarinet, instead of the B, which he has been previously playing, to execute a solo in the key of G major. It is, however, seldom advisable to do this for a short passage, as the air in the tube of an instrument freshly taken up will be cold, and the instrument therefore at first probably out of tune, unless a sufficiently long rest occurs to give the player time to breathe into the tube and warm it, before beginning to play.

304. Before we proceed to give illustrations of the clarinet, there is one other point to be mentioned with regard to its notation. The older French composers, such as Méhul, Cherubini, Boieldieu, and Spontini,* frequently write the clarinets as non-transposing instruments, a plan which, for reasons already given, is not to be recommended, and which is now quite disused. In the score of Cimarosa's 'Matrimonio Segreto' will be seen a curious irregularity. The A clarinets in the overture are written for as transposing instruments in the usual way ; but the B clarinets are written later in the opera *in the tenor clef!* The notes appear on the right lines and spaces for the usual transposition, but an octave too low. This

* See Ex. 115.

seems to have been a clumsy expedient to help the reader of the score.

305. The clarinet is of much later introduction into the orchestra than either the flute, oboe, or bassoon, and its capabilities were hardly fully recognized before the present century. Haydn seldom uses it, except in his later works, though effective solos for the instrument may be found in the 'Creation' and 'Seasons.' Every one will remember the treatment of the clarinet in the airs 'With verdure clad' and 'On mighty pens' in the 'Creation,' and also in the trio 'On thee each living soul awaits' in the same oratorio. Mozart in the later years of his life employed the instrument more frequently. Not only did he write a concerto for the clarinet, and the favourite quintett for clarinet and strings, but all his later operas abound in beautiful passages for these instruments. Our first example is from his 'Così fan tutte.'

Ex. 126. Mozart: 'Così fan tutte.'

Andante.

Clarinetti in B.

p dol.

Fagotti.

p dol.

Corni in E♭. (sounding a major 6th lower.)



306. Notice here first the beautiful effect of the clarinets in thirds, doubled in the octave below by the two bassoons, while the horns sustain the tonic. At the 17th bar is seen a very characteristic effect for the second clarinet—arpeggios in the *chalumeau* (§289) of the instrument. This is one of the specialties of the clarinet, and gives a colouring which nothing else in the orchestra can replace. We have already seen in Ex. 89 an arpeggio for the clarinet; but in the passage there quoted the effect was different, because there it was in a higher register of the instrument.*

307. One more point in the above passage remains to be noticed. In § 199 we spoke of the importance of marking accidentals for both instruments when two were written on

* The present is a suitable place to mention that occasionally in Italian scores passages in the chalumeau are written an octave higher than the notes intended to be played, and '*Chal.*' is marked over the part. The second clarinet part of bar 17 in the above passage would on this plan be written thus:—



This method is not to be recommended, and is only referred to here in case the student should happen to come across a score in which it is found.

one staff. In the last bars of the present extract we see the converse case. The D♯ in the third bar from the end, and the F♯ in the last bar but one (both for first clarinet,) do not require to be contradicted later in the bar, though on the same staff, because these accidentals do not affect the second clarinet.

308. Beethoven, in whose hands every instrument in the orchestra seems endowed with new life, by no means neglected the clarinet. It will suffice to refer to such solos as those in the slow movements of the fourth and seventh symphonies, the whole clarinet part of the Pastoral symphony, and the opening of Florestan's air in the second act of 'Fidelio,' to show to what advantage he displayed the resources of the instrument. Its expressive tone also appealed with great force to Schubert, who treats the clarinet with loving fondness. We may instance the long and touching clarinet solos in the Andante of the B minor symphony as an especially good example of his method of employing the instrument; but, as the score of the symphony is easily obtainable by the student, we prefer to give two examples from works of his which are less accessible. The first is a charming solo from his opera 'Die Verschworenen'—

Ex. 127. Schubert: 'Die Verschworenen.'

Andantino.

Clarinetto 1º in B.

Viol. 1, 2. Viola.

pizz.

Bassi.

&c.

To save space, we have condensed the string parts on two staves.

309. Our other example from Schubert is the commencement of the lovely Shepherd's Melody in 'Rosamunde'—

Ex. 128. Schubert: 'Rosamunde.'

Andante.

Clarinetti in B.

Fagotti.

Corni in B. (sounding a major 9th lower).

pp *fp* *pp* *pp* *fp*

310. It is curious that, excepting for an occasional arpeggio, as in Ex. 126, the older composers seldom made much use of the extremely effective low notes of the clarinet. Weber was the first to discover their full capabilities. In the 'Freischütz' they are used both in the overture, and in the Wolf's Glen scene to depict the supernatural element, and are associated with the character of Zamiel. As an excellent example of Weber's treatment of the clarinet, we give part of the opening symphony of Adolar's air in the second act of 'Euryanthe'—

Ex. 129. Weber: 'Euryanthe.'

Larghetto non lento.

Flauti.

Clarinetto 1º in B.

con anima.

Clarinetto 2do in B.

Fagotti.

1 Viola *Solo.*

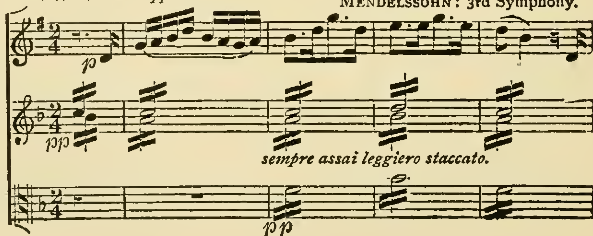
molto legato.

p *p* *p*



It will be seen that this passage embraces the whole range of the instrument excepting the highest register, which is very seldom used in orchestral music. Let the student especially notice the close of the passage, with the lovely effect of the *pianissimo* echo, two octaves lower, of the melody just heard on the flute.

311. Like Weber, Mendelssohn showed special affection for the clarinet. It will suffice to remind the student of the numerous and effective passages for the instrument in the Scotch and Italian symphonies, the overtures to the 'Hebrides' and 'Melusina,' and the opening symphony of the air "Jerusalem, thou that killest the prophets," in 'St. Paul.' We give, as our specimen from his works, the first subject of the scherzo in the Scotch symphony, as an admirable example of a lively melody allotted to the instrument





312. Our next illustration is a very graceful solo from Boieldieu's beautiful, though now little known opera 'Jean de Paris.' In the original score the part is written for a non-transposing instrument (§ 304); we give it here with the modern notation—

Ex. 131.

Moderato. BOIELDIEU: 'Jean de Paris.

1 Flauto.
2 Oboi.

Clarinetto in B.

p

Corni in E♭.
(sounding a major 6th lower.)

cres - - - cen - - - do.

Viol. 1, 2.

p

Viola.
Bassi.

cres - - - - cen - - - - - do.

Fl.

Ob.

pp

tr

p

pp

pp

Ob.

tr

313. Rossini in his scores frequently writes very florid solo passages for his wind instruments. We give an excellent example from the overture to 'Semiramide'; though extremely effective, the passage is by no means easy to play neatly.

Ex. 132. ROSSINI: 'Semiramide.'

Allegro.

Clarinetto 1º in A.

Fagotto 1º

Corno 1º in D. (sounding a minor 7th lower.)

Viol. 1, 2. Viola.

Bassi.

pizz.

pizz.

p

Corni 3, 4, in A *basso.*
(sounding a minor 10th lower.)

p &c.

314. Very charming effects are possible on the clarinet in *pianissimo.* We have seen one in the lowest register at the end of Ex. 129; we now give one lying higher in the instrument—

Ex. 133.

Poco lento. TSCHAÏKOWSKY: Symphonie Pathétique.

Flauto 1º. *pppp* < *pp* > *pppp*

Clarinetto 1º in A. *con tenerezza.* *ppp* < *p* > *ppp*

Fagotti. *pppp* < *pp* > *pppp*

Corni 1, 2, in F. (sounding a perfect 5th lower.) *pp* > *pppp*

Corni 3, 4, in F. (sounding a perfect 5th lower.) *pppp* < *pp* > *pppp*

Timpani in B, F♯. *pppp* < *pp* > *pppp*

&c.

This passage is remarkable from the profusion of *pppp* marked in the score. Such extreme nuances are hardly possible on wind instruments; they merely serve as a direction to the player to subdue his tone as much as possible.

315. Our last example will show the beautiful effect of two clarinets in thirds, entirely unaccompanied—

Ex. 134.

Sehr zart und zurückhaltend. WAGNER: 'Siegfried.'

Clarinetto 1º in A.

Clarinetto 2do in A.

Those who have heard 'Siegfried' will recognize the passage at once. It occurs in the final scene of the third act, at the moment where Siegfried carefully loosens the armour which covers the sleeping Brünnhilde.

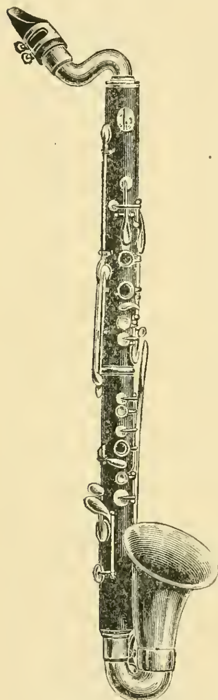
316. We have said little or nothing as to the combination of the clarinet with other instruments, because this point will be more suitably dealt with in the second volume of this work. We will only say here that its tone blends excellently with that of all other instruments, particularly with other wind instruments. It was probably for this reason that Mozart, when he added clarinets to the score of his symphony in G minor, substituted them for the oboes in nearly all the passages for wind alone. Their combination with the flute, bassoons, and horns gives a much more homogeneous body of tone than when the oboes, with their reedy, somewhat obtrusive quality, form part of the harmony.

317. In addition to the three clarinets, of which we have already spoken, other varieties are occasionally to be met with. Mozart in his 'Idomeneo' has written parts in two numbers (the chorus "Placido è il mar," and the air "Zeffiretti") for clarinets in B♮ (Clarinetti in H); he has also employed the same instruments in the air "Per pietà, ben mio, perdona" of 'Così fan tutte.' All three pieces are in the key of E major, and as a clarinet in B♮ would be a semitone lower in pitch than that in C, the clarinet parts are written in the key of F. The instrument is now entirely disused, and in recent editions of the scores of the operas, the parts are transposed for clarinets in A.

318. Clarinets also exist in D, E♭, F, and A♭, none of which need detain us long. All these instruments are higher in pitch than the clarinet in C, and their parts are therefore written correspondingly lower than the actual sounds required. The student will readily understand, after what has been said in §§295–297, that the clarinet in D will be written a tone lower, that in E flat a minor third lower, and so on. The clarinet in D is found in the second act of Cherubini's 'Lodoiska,' and in the final scenes of Wagner's 'Tannhäuser' and 'Die Walküre'; it has also been sometimes employed in modern German dance music, by Lanner, Strauss, and others; but it is not used in the ordinary orchestra. The clarinet in E flat is almost exclusively used in military bands; the only instance which we have found of its introduction into the concert orchestra being in the finale of Berlioz's 'Symphonie Fantastique.' Clarinets in F, transposing a perfect fourth higher, were formerly, and may perhaps still be, employed in German military bands. Parts for these instruments are to be found in the scores of some of Beethoven's Marches for wind instruments, in Mendelssohn's Overture, Op. 24, for a military band, and in the same composer's Funeral March, Op. 103. The small clarinet in A♭, transposing a minor sixth higher, is only used in Austrian military bands. The student should confine himself to the three clarinets in A, B, and C.

THE CORNO DI BASSETTO.

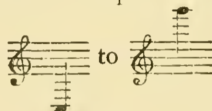
319. The CORNO DI BASSETTO is an Alto clarinet in F, a fifth below the clarinet in C, to which it therefore bears the same relation that the cor anglais does to the oboe. It differs, however, from the other members of the clarinet family in the prolongation of its downward compass to the extent of a major third, its lowest note being



THE CORNO DI BASSETTO.



Excepting in the possession of four additional semitones below, the corno di bassetto (called in English "the basset-horn") exactly resembles in fingering, mechanism, &c., other clarinets, and all that has been said about them applies equally to this instrument. The extremely high notes possible on the clarinet are never used on the corno di bassetto; its utmost available compass is from

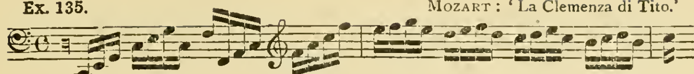


sounding a fifth lower; and the notes above



though possible, are seldom employed, as the same sounds can be more effectively obtained from clarinets. Like the cor anglais, it is written as a transposing instrument, the notes in the score being a fifth above those actually sounded. Its signature will therefore always contain one sharp more, or one flat less, than that of the key of the piece.

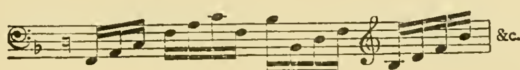
320. A peculiarity in the notation of the corno di bassetto has to be remarked. In order to avoid the use of too many leger lines, it was the custom in the time of Mozart and Beethoven to write the lowest notes of the instrument in the F clef; but instead of giving the true notes, those in the F clef were written an octave lower than their proper pitch. The consequence is, that whereas all in the G clef sounds a fifth lower than written, that which is in the F clef *sounds a fourth higher.* The following example will make this clear :—



This passage written in the G clef will read thus :—



the actual notes sounded being, of course,



In the air from 'La Clemenza di Tito' referred to in §287, in which the clarinet part is written down to C, the same notation is used for the lowest notes. It is difficult to give a reason for the anomaly.

321. The tone of the corno di bassetto resembles in its general character that of the clarinet, to which, however, it is inferior in brilliancy. It is of a rich, but somewhat sombre quality, and has been but seldom employed in orchestral music, and then mostly in pieces of a religious, or quasi-religious character.

322. Very few of the great masters have written for the corno di bassetto. Beethoven only once introduced it in his works—in a very effective number in his ballet of 'Prometheus.' We quote the opening bars, as showing its treatment, first as a melodic, and then as an accompanying instrument.

Ex. 136.
Adagio. BEETHOVEN: 'Prometheus.'

Oboe.

Corno di Bassetto. *dolce.*

Viol. 1, 2. *p*

Viola. Bassi.

As in many preceding examples, we have, to save space, condensed the string parts on two staves. In employing the F clef at the ninth and following bars, Beethoven has adopted the notation explained in § 320.

323. Though he never wrote for it in his orchestral works, Mendelssohn introduced parts for two corni di bassetto into both the pieces he composed for a military band—the overture in C, Op. 24, and the Funeral March, Op. 103. He also wrote two pieces for clarinet and corno di bassetto with pianoforte accompaniment, and it should be mentioned that in writing for the corno di bassetto he uses the G clef exclusively.

324. The only other composer, besides the two just named,

in whose works we have found the corno di bassetto is Mozart, who seems to have had a true insight into its capabilities. In his 'Requiem' the only reed-instruments employed are two corni di bassetto and two bassoons, an appropriately sombre colouring being given to the orchestra by the absence of all the acute wind instruments. In the music of the temple scene in 'Die Zauberflöte' they are introduced with a similar design. In the airs "Traurigkeit ward mir zum Loose" in 'Die Entführung' and "Al desio" in 'Figaro' they replace the clarinets, to give a mellower tint to the wind combinations. Only once does Mozart use the corno di bassetto as a *concertante* instrument—in the air "Non più di fiori," in 'La Clemenza di Tito,' where it is provided with an elaborate *obligato*, from which we gave a short extract in Ex. 135. For our last example of this instrument, we quote a few bars from the same air, in which we find two-part harmony only, the voice being curiously accompanied only by the low notes of the solo instrument.

Ex. 137.

Allegro. MOZART: 'La Clemenza di Tito.'

Corno di Bassetto.

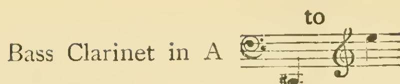
VITELLIA.

Chi ve - desse il mio do - lo - re, pur a - vria di me pie - tà.

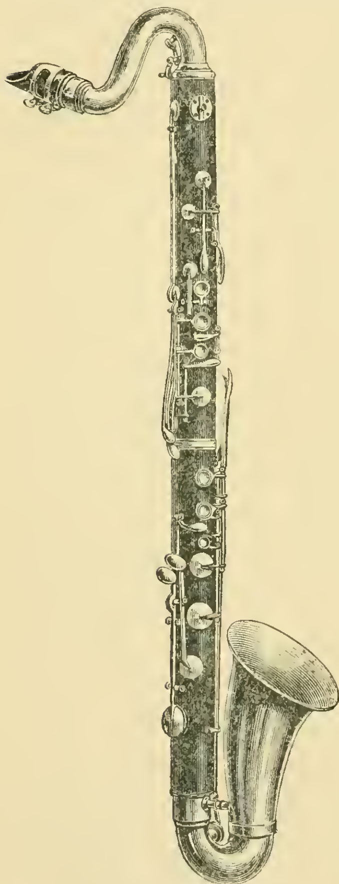
325. The corno di bassetto is now virtually obsolete, though an instrument much resembling it, the ALTO CLARINET IN E FLAT, is in use in military bands. This is a perfect fifth below the B clarinet; unlike the corno di bassetto, it does not possess the additional notes below E.

THE BASS CLARINET.

326. The last member of the clarinet family of which we have to speak is the BASS CLARINET. This instrument is made in B flat and A, being an octave in pitch below the ordinary B and A clarinets. Its compass, as written, extends from [music] to [music], the actual compass of the instrument being, Bass Clarinet in B [music] to [music]



As with the corno di bassetto (§ 319,) the highest notes of the bass clarinet are seldom, if ever employed. The finest part of the instrument is its rich lower register, which resembles in quality the chalumeau of other clarinets. The bass clarinet is not suited for rapid passages, but in sustained melody, or for holding notes in the lower part of the harmony, it is of admirable effect.



THE BASS CLARINET.

327. The bass clarinet is an instrument of comparatively recent introduction into the orchestra. It was, we believe, first employed by Meyerbeer in 'Les Huguenots' (1836), but in that opera it is only heard in a single number, the trio in the fifth act. In his later works he used it more freely. Modern composers occasionally employ it; but in Wagner's later works, as already mentioned (§ 43), it becomes a regular constituent of the orchestra. The student should not forget that if he writes in his scores a part for a bass clarinet, he throws a serious obstacle in the way of performance; for players on the instrument are scarce.

328. Our first example is a very expressive monologue for the bass clarinet, entirely unaccompanied, from the first movement of Liszt's 'Dante' symphony.

Ex. 138. Liszt: 'Dante Symphony.

Bass Clarinet in A.

mf espressivo dolente



Let the student particularly observe the beautiful effect of the sustained low F and E at the end of this passage.

329. Nobody has written more finely for the bass clarinet than Wagner, and our next example is from his pen. It must be said here that he uses a different notation for the instrument from that generally employed. Instead of writing for it, as for the other clarinets, according to the fingering, he writes *an octave lower*. This possibly makes the score a little easier for the student, as the transposition is the same as for the other clarinets; but such a part is certainly more difficult for the player to read, and, for the reasons given in §§214, 298, it is certainly not to be recommended to the composer.

330. The following passage

Ex. 139.

Allmählich etwas langsamer. WAGNER: 'Die Walküre.'

Bass Clarinet in A.
p espress. cres - cen - - - - - - - - - - - do. mf dim - in - u - en - do.

Viol. 1°
pp
cres - - - - - - cen - - - - - - do. mf dim - in - u - en - do.

Viol. 2do
pp
cres - - - - - - cen - - - - - - do. mf dim - in - u - en - do.



shows Wagner's notation. The bass clarinet part would be better written thus :



Notice in the accompaniment for the violins a good example of the "legato tremolo," spoken of in §86.

331. Our last example of a solo for this instrument

Ex. 140.
Quasi Andante. DVOŘÁK : 3rd Symphony.

Clarinetto Basso in B.
mf dim. p

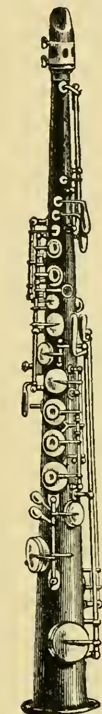
Corni in F. (sounding a fifth lower.)
pp

3 Tromboni.
pp

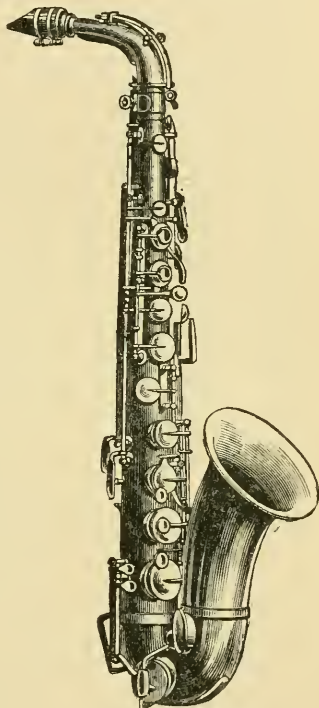
Timpani in A, E.
pp

f
Violas. pizz. pp arco.
pp pp
V'celli. pizz.
pp
C'Bassi. pizz.
pp
&c.

shows a very unusual combination. The bass clarinet, *mf*, is accompanied in the first three bars by *pp* chords for the brass in an unusually low position, with a very soft roll on the kettle-drum ; then, in the second half of the passage, the low holding note is accompanied by *pizzicato* chords on divided violas and celli, with a very strange progression of the harmonies. The effect is as new as it is striking.



THE SOPRANO SAXOPHONE.



THE ALTO SAXOPHONE.

THE SAXOPHONE.

332. The family of Saxophones, invented about 1840 by M. Sax, a celebrated wind instrument maker of Paris, though sometimes incorrectly described as a variety of the clarinet, has no relationship with that instrument, beyond the fact that it is played with a single, and not a double reed. As the instrument is only exceptionally used in the orchestra, and (except in France,) seldom even in military bands, a few words about it are all that will be necessary here.

333. The saxophone is an instrument with a conical tube, like the flute, oboe, and bassoon, provided with a mouthpiece like that of the clarinet. Though always made of brass, it is reckoned among the reed instruments, and not among the 'brass instruments' to be dealt with in the following chapters of this volume. The reason it is not counted as one of the latter family is, that in its mechanism and the manner in which the notes are obtained—by opening or closing holes in the tube, it resembles the flute or oboe. When we come to speak of the horn it will be seen that its notes are produced in quite a different way.

334. The tube of the saxophone being conical, it is able to

produce the octaves of its fundamental tones; its fingering therefore resembles that of the oboe rather than that of the clarinet. Its reed is somewhat larger than that of the clarinet, and bulges slightly in the centre.

335. It is impossible to give in words a clear idea of the tone of the saxophone to anyone who has never heard it; we cannot do better than quote M. Gevaert's description of it. In his 'Nouveau Traité d'Instrumentation' he says it has "a voice rich and penetrating, the rather veiled quality of which partakes at once of the violoncello, the cor anglais, and the clarinet, but with a more intense sonority."

336. No fewer than twelve varieties of the saxophone exist, all of which have approximately the same compass. Music for this instrument is always written in the G clef, and its compass is from to in some varieties, and to in others, with all intermediate semitones. We are speaking of the compass according to the notation and the fingering; the actual sounds produced vary, as with the different kinds of clarinets, according to the instrument which is being played.

337. The following table shows the compass of all the varieties of saxophone:

Ex. 141.

1. Saxophone Sopranino in F. 1*a*. Saxophone Sopranino in E♭. 2. Saxophone Soprano in C. 2*a*. Saxophone Soprano in B♭.

Notation.

Actual Compass.

3. Saxophone Alto in F. 3*a*. Saxophone Alto in E♭. 4. Saxophone Tenor in C. 4*a*. Saxophone Tenor in B♭.

5. Saxophone Baritone in F. 5*a*. Saxophone Baritone in E♭. 6. Saxophone Bass in C. 6*a*. Saxophone Bass in B♭.

It will be seen that there are two groups of six each, numbered 1 to 6 and 1*a* to 6*a* respectively. The former are all pitched either in C or F, and the latter each a tone lower—in B♭ or E♭—being intended for military bands, in which flat keys are almost exclusively employed. With the single exception of No. 2, all are transposing instruments, and even the lowest are noted in the G clef, the fingering of all being uniform.

338. Though capable of great effect, the saxophone has seldom been introduced into the orchestra. It is much used in military bands in France, and is occasionally to be met with in those of this country, but it has never yet been generally adopted. One example of its employment will suffice here—

Ex. 142. BIZET: 'L'Arlésienne.'

Andante molto.

Saxophone Alto in E♭.
p espress assai.
Clarinetto in B.
p
con sordini.
Viol. 1, 2.
ppp
V'cello.
ppp
&c.

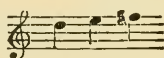
The student should by this time be sufficiently accustomed to transposing instruments to see that the saxophone here sounds a major sixth lower than written. The easiest way to read the part will be to think of it in the bass clef an octave higher, of course making the necessary alterations of the accidentals.

CHAPTER IX.

BRASS INSTRUMENTS: THE HORN AND TRUMPET.

339. There is no section of the orchestra the treatment of which gives so much trouble, and causes so much perplexity to the student as that of the brass instruments. This is not a matter for surprise, if it is remembered that the theory of their tone production differs radically from that of those wind instruments with which we have already dealt. In the flute, oboe, clarinet, or bassoon, the successive notes of the scale are obtained by shortening the length of the column of air contained in the tube (see §§193, 232, &c.); the blowing being the same for all the fundamental notes of the instruments; it is not till the higher part of the compass is reached that the blowing is altered, so as to sound any of the upper partials of the tube, instead of the fundamental tone. And of these upper partials, the only ones frequently employed are the second for conical, and the third for cylindrical tubes, the upper part of the series being only used for a few of the highest notes of the instruments.

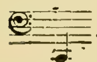
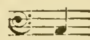
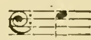
340. Of brass instruments, on the other hand, it may be said in general terms that each note is produced by different blowing. This statement, as will be seen presently, is only partially correct as regards modern instruments, but it is strictly accurate with respect to the "natural" instruments, as they are called, which alone were employed by Bach and Handel. For instance, on the flute or oboe, the three notes—



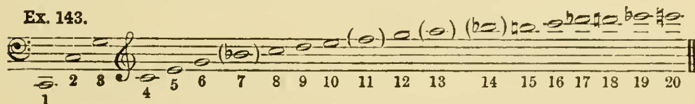
are all obtained with the same pressure of wind, by shortening the tube, as explained in §194; on the trumpet each of these three notes would require a different pressure, or, to use the technical term, a different "embouchure." That the student may understand the construction and treatment of modern brass instruments, it will be needful first to explain the theory and practice of the older (natural) instruments, of which those now in use are a development.

341. We have already more than once had occasion to refer to 'harmonics,' and when speaking of the violin we gave in §94

the first portion of the harmonic series. We showed how these were obtained from a string by causing it to vibrate in segments (halves, thirds, quarters, &c.), instead of throughout its entire length. Similarly, a column of air in the tube of a wind instrument can be made to vibrate in segments by increasing the pressure of air by the player. We saw this with the second octave of the flute (§194). But while, with flutes and reed instruments, very few upper partials above the second (in the case of the clarinet the *third*,) are employed, with the natural horn and trumpet every sound produced is a different note of the harmonic series.* It will first be necessary to give the notes of this series.

342. Exactly the same natural laws which regulate the vibration of a string in segments also govern that of a column of air in a tube. Supposing a column of air eight feet in length is set in vibration, the lowest note it will be capable of producing—what is called its "fundamental tone" — will be . If, by increasing the pressure of air, it is made to vibrate in halves, it will give the note . By further increasing the pressure, and causing it to vibrate in thirds, we get the twelfth of the fundamental tone , while a still greater pressure gives the double octave, C. On the horn and trumpet many higher upper partials can be obtained. We give the whole series up to No. 20.

Ex. 143.



The notes enclosed in brackets are out of tune in the key; Nos. 7, 13, and 14 being somewhat too flat, and No. 11 considerably too sharp, being approximately half-way between F♮ and F♯. The highest notes of the series are not used at all in modern music; we have included them because we shall have to refer to them later. The series in actual use ends at No. 16.

343. It will be seen that this series extends over more than four octaves. It must not be supposed, however, that any brass instrument has such a compass as this. The law which regulates the production of these harmonics in a tube is the following :—The longer the tube, and the narrower it is in

* We are, of course, speaking only of the *open* notes of the tube; we shall see later that some other notes can be artificially produced on these instruments by "stopping" (§ 356).

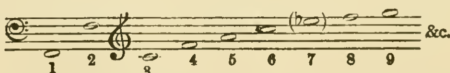
proportion to its length, the easier it becomes to obtain the upper partials, and the more difficult to sound the fundamental tone.

344. On examining the series more closely, we find that in its lower part only the notes of the tonic chord are produced. It must be remembered that no intermediate notes can be obtained. If we require, for instance, the D lying a tone above No. 2 or No. 4, we can only get this by altering the length of the tube. Even the diatonic scale is impossible until we come to No. 8, and, excepting B♭ (which, we have already said, is out of tune,) no chromatic notes are available till we reach the fifth octave, at No. 16, the notes of which octave are not available, as they require an almost impossibly high pressure of air from the player.

345. The natural horn and trumpet—the only instruments of which we are at present speaking—are therefore strictly diatonic, and can only play in one key. Supposing the fundamental note of the tube to be the C (No. 1 of our example), the instrument would be said to be in C ; and a trumpet in C, as just said, could play in no other key. Obviously it would be exceedingly inconvenient for a player to have to provide himself with a separate instrument for each key. The instrument maker therefore obviated this necessity by constructing the tube in sections, some of which were detachable, and could be replaced by others of different lengths. These were called "crooks," and were attached to the tube at the end nearest the player. If, for instance, a player whose trumpet or horn is in C wishes to play in D, he takes off his C crook, and puts on the D crook, which is shorter. He has now virtually a new instrument, just like a clarinet player, who has changed his A clarinet for his B. The shorter tube now gives out its own series of upper partials, bearing precisely the same relation to the new fundamental tone, D, that the notes of the series given in Ex. 143 bore to C. We give the first part of the new series :—



The student will easily complete the series for himself. Similarly, if the 'F crook' were employed, the series would be



346. Whatever crook may be in use, or, in other words, whatever the actual length of the tube on which the performer

is playing, the pressure of air varies for each note of the series, increasing for the upper notes, and decreasing for the lower ones. But as this pressure is practically the same for the same note of the series, whatever be the crook, the parts for the horns and trumpets are always written in the key of C, for a similar reason to that already explained in speaking of the transposing flutes and clarinets. To write the real note to be sounded would greatly complicate matters for the player. Suppose, for instance, that the note the composer wishes heard is [musical note], and that this note is written in the horn part. If he is playing on his C horn, the performer will have to sound the twelfth note of the series,* if on an F horn the ninth, on a G horn the eighth, and so on, and there would be constant risk of mistakes. But, with the notation actually in use, the G just given shows him that he is to play the sixth note of the series, and the note that is sounded will depend upon the crook that he is using at the time.

347. The student should by this time be sufficiently accustomed to reading the transposing instruments to have little trouble in reading the horn or trumpet parts which he will find in the scores of the great masters. He has only to remember that C always represents the tonic, G the dominant, E the mediant, &c., of the key in which the instrument is crooked ; and this is always indicated at the beginning of the movement, or in the course of it, if there be a change of crook. Which tonic or dominant—whether above or below the note written in the score—will be explained presently.

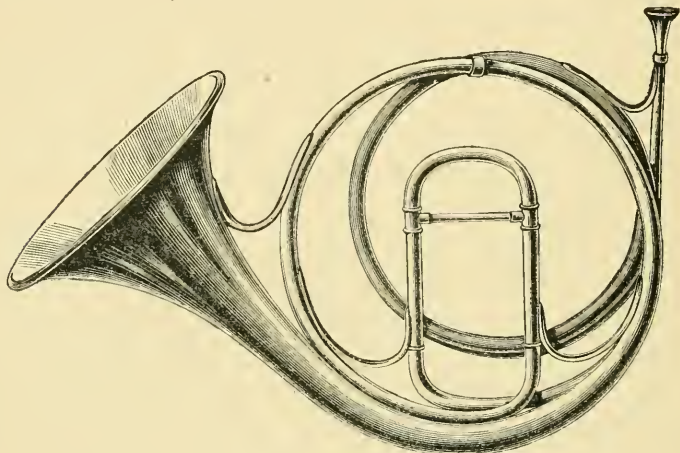
348. It will be convenient to divide brass instruments into two classes :—those in which the higher partial tones, above No. 8, are freely employed, and those in which the notes in general use end with No. 8. To the first class belong the horns and trumpets, to the second the cornets, trombones, tubas, &c. We shall deal with the former in this, and with the latter in the next chapter.

THE HORN.

349. The HORN (*Ital.* Corno, *Fr.* Cor, *Ger.* Horn) is a conical tube of brass, the length of which varies greatly according to the crook which is employed. On the horn in F, which is the one most frequently used by players in the present day, the tube is about 12 ft. long ; but that of the horn in high B flat (commonly described as 'in B♭ alto,') is only about 9 ft. in length, while in low B flat ('B♭ basso,') the tube will be just twice as long, because the pitch of the horn is an octave lower.

* It will be explained presently that the C horn sounds an octave lower than written (§ 353).

350. The horn is played through a "mouthpiece"—a conical, or funnel-shaped, piece of brass inserted in the small end of the tube. The shape of the mouthpiece of the horn differs from that of all other brass instruments; in the trumpets, trombones, &c., it is cup-shaped; and this difference is chiefly instrumental in giving the peculiar tone which distinguishes the horn. The quality of brass instruments depends upon two things—the width of the tube as compared with its length, and the shape of the mouthpiece.

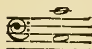


THE NATURAL HORN.

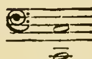
351. Music for the horn is written in the G clef, excepting sometimes for two or three of the lowest notes, *i.e.* for Nos. 2, 3, and occasionally 4 of the series given in §342. It must be said here that the fundamental note of the series (No. 1,) cannot be obtained at all with the ordinary mouthpiece. When the lower notes are written in the F clef, it has been the curious and illogical method of composers to write them an octave lower than their proper notation. We have seen the same irregularity in the case of the Corno di Bassetto (§320). Supposing, for example, that the two horns are playing the notes 2 and 4 of our series, the notes in the G clef would be



These notes, if written in the F clef, to save leger lines, would obviously be



but the universal practice of the great masters has been to write them thus :



The student will find an example of this in the first bars of Spohr's overture to 'Jessonda.' Modern composers sometimes dispense with the F clef altogether.

352. For the sake of the students of old scores, it should be mentioned that in them we sometimes find other clefs used for the horns. This was done with the view of assisting the score reader by showing him the transposition, without embarrassing the player. For instance, it will be seen directly that the horn in F transposes a fifth lower, like the cor anglais. In Spontini's 'Vestale,' a horn solo in that key, which we shall quote later in this chapter (Ex. 147,) is written with the mezzo-soprano clef. The player has only to think of his part as written in the G clef to know what note he has to play, while the reader has the real notes before him. In Cimarosa's 'Matrimonio Segreto' horns in E flat are written in the bass clef. Here the notes, if read in the G clef, are right for the player, but the reader has to transpose them an octave higher. Other irregularities are to be found in old scores; the student must be prepared for them if he meets with them.

353. We have already referred (§ 345,) to the different crooks which enable the horn to be played in any key; we now give a list of them, showing the transposition effected by each as compared with the notation. It must be remembered that in every case the note sounded is *lower* than that written.

Horn	in B♭ *alto*	sounds	a tone lower.
„	in A	„	a minor 3rd lower.
„	in A♭	„	a major 3rd lower.
„	in G	„	a perfect 4th lower.
„	in F	„	a perfect 5th lower.
„	in E	„	a minor 6th lower.
„	in E♭	„	a major 6th lower.
„	in D	„	a minor 7th lower
„	in C	„	an octave lower.
„	in B♭ *basso*	„	a major 9th lower.

There are no crooks for the horn in F♯ (G♭), D♭ (C♯), B♮ *basso*, and A *basso*, but the horn can be put into these keys (all of

which are occasionally to be met with,) by drawing out a slide in the tube, and thus lowering the pitch by a semitone.*

354. We have already said that the length of the horn varies from about nine to about eighteen feet, according to the crook employed ; we also said (§ 343,) that the longer the tube, the more readily it produced its higher upper partials. The consequence is, that the compass of the horn is not the same in all keys. In the lower keys, the lower notes of the series speak slowly, while in the higher keys the upper notes cannot be produced at all. The student should not write any note above the twelfth upper partial ( ) for any horn higher than F. Even in the lower keys he will do well to be very sparing of the extreme upper notes.

355. Another point to be borne in mind in writing for the horn is, that as the embouchure changes for each note, a player who is accustomed chiefly to the higher notes will find it difficult to produce the lower ones, and *vice versâ.* For this reason it is best not to write the part for a first horn too low, nor that for a second horn too high ; the former should seldom go below , and the latter still more rarely above . It should also be remembered that a sudden leap from a low to a high note, or the reverse, is always difficult, and somewhat uncertain, owing to the great alteration of embouchure required.

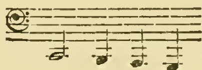
356. The notes obtainable on the natural horn are not limited to the harmonic series given above. By inserting his hand in the bell of the instrument, the player can flatten the 'open notes,'—that is, the natural harmonics of the tube—to the extent of a semitone, or even a tone. Such notes are called "stopped" or "closed" notes, and the natural horn is, for this reason, frequently called the 'Hand Horn.' These notes have a different quality from the open notes, being more or less veiled, or muffled. The further the hand is pushed into the bell, the duller the sound becomes. The best closed notes are those which require the least lowering. We said in § 342 that the note was too flat ; by lowering it rather less than a semitone the player gets a good A. Similarly, the eleventh note of the series, which lies between F and F♯, only requires

* Higher crooks were formerly in use. In Mozart's 18th symphony, and in the final chorus of Haydn's 'Seasons,' we find parts for 'Corni in C alto,' which would sound as written ; while in Mozart's 19th symphony there are parts for 'Corni in Es (E♭,) *alto*'—an octave higher than the usual horns in E flat, and therefore, like the E flat flute and clarinet, sounding a minor third higher than written.

a little flattening to be perfectly in tune for F♮. The other open notes can all be lowered a semitone; if lowered a tone, they become so dull as to be practically useless.*

357. Except in solos, the great masters were very sparing in their use of stopped notes; in the present day, now that the valve-horns, to be described presently, are universally employed, they are not wanted at all, except for special dramatic effects, as will be seen later.

358. A few additional notes are possible on the natural horn. By gradually relaxing the lips, and with the assistance of the hand, the note No. 2 of the series can be lowered to the extent of a perfect fourth. The notes thus obtained are called "artificial" or "factitious" notes. They are difficult and of somewhat uncertain intonation, though perfectly easy, as will be seen later, on the valve horn. Such notes were always written in the F clef,



and, of course, sound higher than they appear in the score. They are but seldom used, and only for special effects. The low G will be seen in the slow movement of Beethoven's ninth symphony, but probably one of the best instances of their employment is the following, from an early symphony of Haydn.

Ex. 144 HAYDN: Symphony in B flat, No. 24.

Adagio sostenuto.

Solo.

Corni in E♭. *p espress.*

con sordini.

Viol. 1°. *p*

con sordini.

Viol. 2do. *p*

Bassi. *p* (Viola col Basso, all 8va.)

* Stopped notes seem to have been discovered toward the close of the last century. In Sir John Hawkins' 'History of Music' we find the following note on the subject:

"In the beginning of the year 1773, a foreigner named Spandau played in a concert at the Opera House a concerto, part whereof was in the key of C with the minor third, in the performance whereof all the intervals seemed to be as perfect as in any wind instrument; this improvement was effected by putting his right hand into the bottom or bell of the instrument, and attempering the sounds by the application of his fingers to different parts of the tube."

The rests below the horn solo in the first eight bars show that the passage is to be played by the *first* horn, while those above the notes in the last four bars, indicate a solo for the *second* horn. The passage would be too low for the first horn (§ 355). We see here also the notation in both clefs; the student will remember that, while the part in the G clef sounds a major sixth lower, that in the F clef sounds a minor third higher than written.

359. The mute (*sordino*,) is occasionally employed for the horn. It is made of leather or *papier mâché*, is conical or pear-shaped, and is inserted in the bell of the instrument, producing a muffled tone, somewhat similar to that of the stopped notes. Wagner has made very effective use of the muted horns in the third scene of 'Das Rheingold,' but the occasions for their employment are extremely rare.

360. The tone of the horn is one of the most expressive, and perhaps the most poetic and romantic in the orchestra. Though sometimes used for lively solos, hunting calls, &c., it is far better adapted for dreamy and melancholy passages. Everyone knows the effect of the opening solo of three notes for the horn in the first bar of the overture to 'Oberon,'

Ex. 145. WEBER: 'Oberon.'
Adagio sostenuto.
Solo.
Corno in D.
dolce.

and some of the examples we shall give later will show its capabilities better than any verbal description. Its upper notes, above No. 10 of the series, are rather thin; and it must not be forgotten that a horn part written very high soon becomes fatiguing to the player, because of the great pressure of the lip needed to produce them.

361. Formerly it was rare to find more than two horns in the orchestra. Haydn seldom writes for more, and Mozart, though we find parts for four horns in some of his earlier symphonies and operas, writes for only two in all his latest and ripest works. Three horns are employed by Beethoven in his 'Eroica' symphony, and by Cherubini in his opera 'Les Deux Journées'; but in nearly all important modern works we find four.

362. When two horns are used by the great composers, these are generally in the key of the tonic, if the movement be in a major key; if in a minor key, the horns will be either in the key of the tonic, or in that of the relative major. But to this general rule there are many exceptions. It is needless to go fully into this question now, for reasons that will be understood when we come to speak of the valve-horn. If there be parts for four horns, they will sometimes be all in the same key, at other times two in the tonic and two in some nearly related key—the dominant or subdominant for a major key, and the relative major for a minor key. Here again the composer was largely influenced in his choice by considerations of harmony. We have seen that the natural horn has only a limited number of open notes; and the object of the composer was to have as many of these open notes as possible. Some composers, especially Meyerbeer and Berlioz, have gone even farther in this direction, and have put each of the four horns into a different key. This method complicates the reading of the score terribly, without offering compensating advantage to the player, to whom it is difficult to play in a key remote from that of the piece.

363. This brings us to a most important consideration, which applies alike to natural and to valve horns, and, to a greater or less extent, to all brass instruments. It is absolutely necessary, if the part is to be effective, to *write vocally* for the horn. This is a point far too often overlooked; but it must never be forgotten that a horn player is like a singer in this respect, that he cannot depend upon producing with accuracy and certainty any note which he cannot hear in his mind's ear before he sounds it. If, therefore, a horn passage be difficult to sing, it will certainly be difficult to play, and most probably ineffective as well. Let the student notice, in the examples we are going to give, how very vocal all the horn passages are.

364. We now, before proceeding to speak of the valve horn, give some illustrations from the great masters of the treatment of the natural instrument, and we begin with some solo passages. Our first extract is from Cherubini :—

Ex. 146. CHERUBINI. 'Elisa.'

Larghetto.

Corno in E♭

Viol. 1, 2.

Viola.

Bassi.

Notice here the treatment of the stopped notes; they are mostly taken immediately before or after the open notes from which they are obtained. This is much the best and most effective way to write them.

365. Our next example illustrates some other points.

Ex. 147. SPONTINI: 'La Vestale.'

Andante cantabile.

Corno in F. *p*

Arpa. *p*

Viol. 1, 2. *pp*

Viola 1, 2. *pp*

Bassi. *pp*



This is the passage to which we referred in §352. We have replaced the mezzo-soprano clef by the usual notation. Observe first that, though the key of the piece is C major, the horn is not crooked in that key, but in F. At first sight, the student would be inclined to think that the passage would be easier for the C horn, as there would not be nearly so many closed notes :—



but this is not really the case. The choice of the F horn here illustrates an important point not yet mentioned. On the low horns florid passages, such as are seen here, are very difficult, if not impossible, because in the longer tubes the column of air does not so easily change its rate of vibration. It is, in fact, a somewhat parallel case to that of the long strings of the double-bass, noticed in an earlier chapter of this volume (§145). The best keys for the horn are those of F, E♮, and E♭; it is seldom that an important solo is written for it in any other key. The solo we are now discussing is difficult in any case, and, owing to the inequality of tone of the stopped and open notes, it would be much more effective, as well as easier, on the valve horn, on which, it would, if the opera were performed, unquestionably be now played.

366. Other fine examples of solos for the horn, which our space will not allow us to quote, will be found in the Notturno of Mendelssohn's 'Midsummer Night's Dream,' at the commencement of the duet "I waited for the Lord" in the 'Lobgesang,' and in the air "Viens, gentille Dame," in

Boieldieu's 'La Dame Blanche.' Schubert frequently treats the horns most effectively, as, for instance, in his great symphony in C, which opens with an unaccompanied passage for two horns in unison. We quote a remarkable effect from the andante of the same work.

Ex. 148.

Andante sostenuto. SCHUBERT: Symphony in C, No. 7.

Corni in C. *a 2.* *pp* *dim.*

Viol. 1, 2. Viola. *pp* *dim.*

V'celli. 1, 2. C'Bassi.

(To save space, we condense the string parts on two staves.) Everyone who has heard the symphony will remember the magical effect of the cry of the two horns on the upper G against the changing harmonies of the strings. Notice that here the upper G is not an impossible note for the second horn, because of the low crook that is used. On the F horn the note would have been more risky for the second player.

367. Our next example, also by Schubert,

Ex. 149.

Andantino sostenuto. SCHUBERT: 'Lazarus.'

Corni in F. *pp*

MARIA. Steh 'im

Bassi. *pp*

pp

letz - ten Kampf dem Mü - den,

shows two horns unaccompanied except by the basses, and, in the last three bars, filling up the middle parts of the harmony.

368. Duets for two horns, such as the above, are very effective, especially if use be chiefly made of the open notes. Our next quotation illustrates this, and also furnishes a charming example of a duet for horn and soprano voice.

Ex. 150. MEYERBEER: 'Les Huguenots.

Larghetto.

Corni in D. *dolce.*

VALENTINE.

V'celli.

Ah! l'in - grat d'une of - fen - se mor - tel - le

cresc. *dim.* *cresc.* *dim.* *p*

A bles-sé......... mon cœur ten - dre, mon cœur tendre et fi - dè - le.

Notice how skilfully the harmony is here disposed. Though until the last bar there are never more than three parts, there is no effect of thinness.

369. Passages for three or four horns unaccompanied are frequently to be found in modern scores. A beautiful example is the following :—

Ex. 151.
Larghetto.
WEBER 'Preciosa.
3 Corni in D.
dolce.

It is seldom that the three horns are written on the same staff, as here; usually the third horn has a staff to itself. Notice in the third bar the F♮'s for the second and third horns. This is a stopped note of very poor quality (§ 356), but at the time 'Preciosa' was composed (1820,) valve-horns were not in use.

370. We next give two examples for four horns by Rossini—himself a horn player. The first, taken from the overture to 'Semiramide,'

Ex. 152.
Andantino.
ROSSINI: 'Semiramide.
Corni 1, 2, in D.
Corni 3, 4, in D.
p
p
ff
&c.

is far easier and more effective on the valve-horns than on the natural instruments for which it was written in 1823.

371. As all the passages hitherto quoted have been in slow time, we give for our last illustration a lively fanfare for four horns from the first act of 'Guillaume Tell.' The passage is too long to quote entire.

Ex. 153.
Allegro.
ROSSINI: 'Guillaume Tell.
Corni 1, 2, in E♭.
Corni 3, 4, in E♭.
f
sf
sf



The only point calling for remark in this extract is the shake in the second horn part. Shakes are possible, though difficult on the medium notes of the horn—between No. 6 and No. 10 of the series given in Ex. 143. We have said nothing about them hitherto, because they are of so little practical use. On the valve-horn, as will be seen later, they are very much easier.

372. In the examples we have given, the horn has been in every case treated as a solo instrument, but it is also one of the most useful members of the orchestra in combination with others. This has been incidentally shown in several of the examples given in preceding chapters, *e.g.* Exs. 80, 89, 126, 133, and will be dealt with more fully when, in the second part of this work, we treat of orchestral combination.

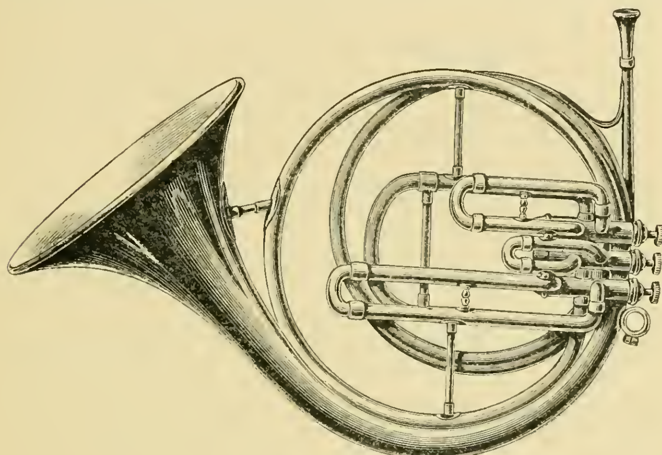
THE VALVE-HORN.

373. Though the natural horn which we have been describing is the one exclusively written for by the great composers of the last, and the early part of the present century—it was, in fact, the only one known at that time—it is now almost entirely superseded by the valve-horn, though occasionally a player may be found who still uses the older instrument. It has been necessary to go in considerable detail into the theory of the natural horn, because unless the student clearly understands this, it will be quite impossible for him to write effectively for the modern brass instruments, all of which possess a complete chromatic scale.

374. The VALVE-HORN (*Fr.* Cor-à-pistons, *Ger.* Ventilhorn, *Ital.* Corno Ventile, or 'Corno Cromatico,') was invented during the first quarter of the present century, and was first introduced into the orchestra by Halévy, in 'La Juive' (1835). Of German composers, Schumann was the first to employ it, and at the present day its use is almost universal. Though the details of its mechanism vary slightly in different

instruments, the general principles of its construction, which we now proceed to explain, are the same in all types.

375. It was said in § 345 that the natural horn could only play in one key, and that, in order to go into a different key, it was necessary to change the crook. This, of course, requires time, and the composer had to allow several bars' rest to the player for the purpose. The valves obviate this difficulty by furnishing a means of instantaneous transposition. If the student compares the picture of the natural horn given on p. 180 with that of the valve-horn here shown, he will see that the



THE VALVE-HORN

latter has at the side three additional pieces of tube, differing in length, with a piston to each. When the instrument is played without using any of the pistons, the air travels straight through the tube, exactly as with the natural horn, and the same series of harmonics will be produced. But if one of the pistons be pressed down, the air is diverted from the main body of the tube, and passes through the extra length of tube connected with that piston. The result is that the column of air set in vibration is longer than before, and we have really a horn *in a different key*.

376. It will be seen that the piece of tubing connected with the second piston is the shortest, and that opened by the third is the longest. When the second piston is pressed, the pitch of the horn is lowered a semitone, with the first piston a tone, and with the third three semitones. The third and second pistons both put down together lower the pitch four semitones, the first and third five, and all three together six semitones. As there are only six semitones between notes 2 and 3 of the

harmonic series, it is clear that this mechanism gives us a horn with a complete chromatic scale throughout its entire compass. As soon as the finger quits a piston, a spring inside restores it to its original position.

377. An example will best show the effect of the pistons.

Ex. 154.

Notation.

Effect— Horn in F. (natural.)

Ditto with piston 2.

With piston 1.

With 3 (or 1 + 2.)

With 2 + 3.

With 1 + 3.

With 1 + 2 + 3.

Supposing the horn to be in F—the most usual key for the valve-horn, and the notes to be played are those given on the upper line of this example, it will be seen that, by using the second piston, the horn is put into E♮, with the first piston into E♭, and so on; the player can, in fact, play in seven keys, instead of in only one. But he can also use in the key of F all the notes belonging to the other scales.

378. To illustrate this, we take the opening of the horn solo by Spontini given in Ex. 147. As already said, it was written for the natural horn; we write under it the notes which the player would blow, and below them the pistons that would be employed, if played on the valve-horn. The absence of a sign indicates an open note.

Ex. 155.

Corno in F.

Open note blown.

Pistons used. 1/2 or (3) 2 2 2 1 2 1/2 (3) 2 1/2 (3) 1 1/2 (3) 2



There are a few points to notice here. The A's at the beginning of the passage, and in the following bars, *could* be played with the second piston, blowing B♭, the seventh note of the series; but they would be a little too flat (§342); it is therefore better to take them from C.

379. It will be seen that the note A is marked to be played with the third valve, as an alternative to the first and second together. This illustrates an important fact with regard to the pistons. We said above that the first piston lowered the pitch of the horn a tone, and the second a semitone. Now the ratio of a semitone is 15:16—in other words, to lower a note by a semitone $\frac{1}{15}$ must be added to the length of the vibrating body. Similarly, the ratio of a major tone being 8:9, we must add $\frac{1}{8}$ to the tube to lower it a tone. The horn in F is just over 12 feet in length; the second piston adds about 10 inches, and the first about 18. When the first piston is put down, and the horn has become for the time a horn in E flat, its tube is about 13 feet 8 inches long. But the addition of 10 inches, which was sufficient to lower the F horn a semitone, is not enough for the E flat horn, for $\frac{1}{15}$ of 13 feet 8 inches is almost exactly 11 inches. Therefore whenever two pistons are used together, the note is too sharp, and this is still more the case when all three are used. It is, however, in the power of the player to correct the false intonation by slightly flattening the note with his hand, exactly as on the natural horn.*

380. Though it must be admitted that the quality of tone of the valve-horn is slightly inferior to that of the natural instrument, the difference, in the hands of a good player, is so small that it is more than compensated for in other ways. The perfect equality of tone, and the increased facility of execution, have caused it to be universally adopted by modern composers. The best key is that of F, and most players at the present day use no other crook. Some composers also write for the F horn, whatever the key of the music, with the result of making their scores more difficult to read. The student will see an illustration of this in the horn parts of Ex. 133. The

* As a matter of fact, horn-players mostly use the first and second pistons together, rather than the third alone, as the latter has to be played with the weak third finger.

passage is in B major, and the horns are here playing in the key (for them) of F♯ major. Had they been in E, the score would have been much simpler.

381. When writing for horns in F, a few composers put key-signatures, as for the corno inglese. This plan, however, is not generally adopted; it is more usual, and we think preferable, to mark all accidentals as they occur, just as with the natural horns. We also do not recommend the student to write for F horns exclusively. The keys of E♮ and E♭ are also very good, and in many cases easier to write in; if the players choose to transpose the parts, that is their affair.

382 Stopped notes are available on the valve-horn, even more freely than on the natural horn. As every note is possible as an open note, it is evident that each can also be lowered a semitone with the hand. When stopped notes are desired for special effects, their employment is occasionally indicated by writing the word "stopped" or its French equivalent "son bouché" over the note, but more frequently by the sign +. It is possible on the valve-horn to echo in stopped notes a passage that has just been given in open notes; *e.g.*:—



For the last three notes the player must sound A♭, C, E♭, and lower each note half a tone with the hand. Wagner, in his later works, has made very effective use of these stopped notes.

383. Owing to the possibility of changing the key of the valve-horn by means of the pistons (§377), it is much less often needful than on the natural horn to change the crook of the horn in the course of a movement. When this is desired, a rest of about eight bars of moderate time should be allowed for the purpose. Wagner, in his 'Lohengrin,' has sometimes indicated a change of crook, without any rest at all. In the second act is found the following:—

Ex. 156. Wagner: 'Lohengrin.'

Corni in D. in C. in D. in C.

We utterly fail to conceive why Wagner has adopted this impracticable notation, which is likely to confuse the player, and most certainly does not help the score-reader. The obvious manner of writing the passage would be either



both of which would have been easier to read and to play.

384. Though the valve-horn, as we have seen, possesses a complete chromatic scale, there could be no greater mistake than to treat the instrument as if it were an oboe or a clarinet. The very important hint given to the student in § 363, must never be forgotten. Unless the player knows beforehand what note he has to sound, he cannot depend upon getting it. There is probably no point connected with writing for the horn which the student is so likely to disregard, and it cannot be too strongly insisted upon.

385. A most instructive illustration of this point is furnished by Schumann's Concertstück, Op. 86, for four horns with orchestra—probably one of the most difficult works ever written for the instrument. The first horn part is especially trying, as Schumann has written it up to D and E above the staff (the 18th and 20th harmonics). It is written for valve-horns, and is quite impossible on the natural instruments. But while Schumann, according to his custom, has used chromatic harmony freely, the horn parts are always *vocal.* To show this, we give the commencement of the first passage for the solo instruments. To save space, we condense the orchestral accompaniment on two staves.

Ex. 157. *Lebhaft.* Schumann: 'Concertstück,' Op. 86.

Corno 1 in F. — *p fp f fp f p*

Corno 2 in F — *fp f p*

Corno 3 in F. — *fp fp p*

Corno 4 in F — *fp fp p*

Orchestra. — *p* Str. *f* Tutti. *p* Str. *f* Tutti. *p* Str.

sf

V'cello

p p p p p

p

In the last four bars flutes and oboes are added, doubling the strings in the upper octave. Let the student examine the horn parts separately, and notice how easy each one is to read, and, in spite of the numerous accidentals, how naturally the melody flows in all the parts. This is what we mean by writing *vocally* for the horn.

386. Our last example for the valve-horn illustrates the same point.

Ex. 158. WAGNER: 'Tristan und Isolde.'

Sehr ruhig und nicht schleppend. (*Very quiet, and not dragging.*)

Corno 1 in E. *pp* *più p*

Corno 3 in E. *pp* *più p*

Corno 2 in E. *pp* *più p*

Corno 4 in E. *pp* *più p*

TRISTAN.

Wie sie se - lig hehr und

Contrabassi. (senza V'celli.)

mil - de wan - delt durch des Meer's Ge - fil - de?

ppp

(For the notation of the fourth horn, see § 351.) Here is another passage even more chromatic than that by Schumann just quoted, but it presents no excessive difficulty to any of the players, owing to the skilful way in which the parts are written. Notice also that the lower notes of the harmony are given to the second and fourth horns—the lower one of each pair (§ 355). To make the score easier to read, Wagner has written the third horn above the second.

387. Before leaving the horn, a word must be said about the Post-Horn. This is a small conical tube, made of brass or copper, about four feet in length, and blown through a cup-shaped, or hemispherical mouthpiece. It is generally made in the key of C or B flat, and produces only the natural harmonics of the tube, from No. 2 to No. 6, or possibly No. 8, of the series. It is not a regular constituent of the orchestra, and is only mentioned here for the sake of completeness, because it is to be found once in the works of Mozart, and once in those of Beethoven—in each case in dance music. We give the opening of the solo in Beethoven's dance.

Ex. 159. Beethoven : Zwölf Deutsche Tänze, No. 12.

Post Horn in C. &c.

It is needless to quote the accompaniment, which consists only of the chord of C major. Neither by Mozart nor Beethoven are any other notes used than the four here seen.

THE TRUMPET.

388. The Trumpet (*Fr.* Trompette, *Ger.* Trompete, *Ital.* Tromba,*) while possessing many points of resemblance to the horn, differs from that instrument in the fact that its tube is cylindrical throughout the greater part of its length, and only opens conically towards the bell. It is also bent, as will be seen in the accompanying picture, in quite a different shape from the horn. The tube, in its cylindrical part is only three-eighths of an inch in diameter, and the instrument is played with a hemispherical mouthpiece, not, like the horn, with a conical one.

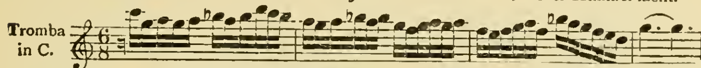
389. The tube of the trumpet is only half the length of that of the horn in the same key ; for example, while the horn in F is about 12 feet in length (§ 349), the trumpet in F is only 6 feet. Obviously, therefore, the pitch of the trumpet is an octave higher than that of the horn.

390. The natural scale of the trumpet is that of the

* In old scores the instrument is more frequently called 'Clarino'; the name given in the text is now almost universally employed.

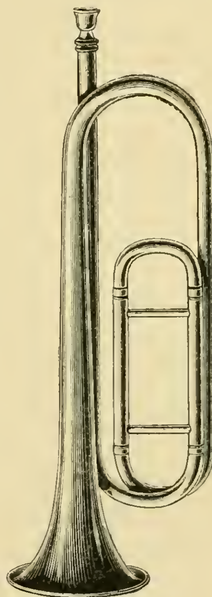
harmonic series given in §342. As on the horn, No. 1 of this series is not available, and the higher notes (above No. 12,) are, with extremely rare exceptions not used in modern music, though they are very common in the scores of Handel and Bach, especially of the latter, who even employs the eighteenth note of the series. The following passage will illustrate not only his use of extremely high notes, but his very florid treatment of the instrument.

Ex. 160. J. S. BACH: Cantata: "Der Himmel lacht."



Such a passage as this would be nearly, if not quite impossible to most trumpet players at the present day; it will be interesting to explain in a few words the difference of treatment in the last century and in this.

391. In the time of Bach and Handel trumpeters were divided into two classes known as 'Clarinbläser' and 'Principalbläser.'* The former practised mostly the upper register of the instrument, the latter the lower. By long practice, and the use of a special mouthpiece, the 'Clarinbläser' obtained great command of these upper notes, while the 'Principalbläser' were seldom required to play above , the eighth note of the series. In Handel's 'Dettingen Te Deum' and 'Occasional Oratorio,' the third trumpet is called 'Principal' in the score; and in Haydn's Imperial Mass the parts for the three trumpets are indicated as 'Clarino 1, 2' and 'Clarino Principale.'†



THE NATURAL TRUMPET.

392. Music for the trumpet, like that for the horn, is written in the G clef, and in the key of C. The F clef is hardly ever employed, as the low C (No. 2 of the series,) is much more rarely written for the trumpet than for the horn, the quality not

* *i.e.* Clarin-players and Principal-players.

† It would be quite possible to play Bach's parts on the modern natural trumpet; but a player who practised them much would probably lose the certainty of his embouchure for the passages required in modern music, in which the lower notes are more frequently used. In modern performances of Bach's works his trumpet parts are generally played on a specially constructed 'Long Trumpet,' into the special features of which we need not enter, as it is never employed for modern music.

being very good. Quite exceptionally, other clefs have been employed. In two of Mozart's early masses (Nos. 4 and 5), which contain parts for four trumpets, the parts for the second pair (called 'Trombe Ripieni,') are written in the alto clef in No. 4, and in the bass clef in No. 5; but we know of no more recent instance of departure from the ordinary notation. It should be said here that Handel always writes his trumpets at the real pitch, as non-transposing instruments, while his contemporary, Bach, adopts the modern plan, writing them in the key of C.

393. We said just now that the trumpet was in pitch an octave above the horn in the same key; we must now add that the trumpet is not used in so many keys as the horn. The crooks employed by the great masters, with the transpositions effected (compare §353,) are the following:

Trumpet	in F	sounds	a perfect 4th higher.
"	in E♮	"	a major 3rd higher.
"	in E♭	"	a minor 3rd higher.
"	in D	"	a major 2nd higher.
"	in C	"	as written.
"	in B flat	"	a tone lower.

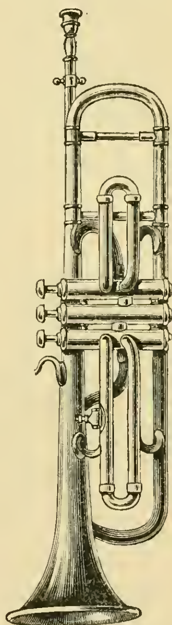
394. In addition to these keys, a few others are exceptionally to be met with. These are the trumpet in G, sounding a perfect fifth higher than written, to be seen in Auber's 'Actéon' and 'Le Lac des Fées,' the trumpet in C♯ (or D♭,) sounding a semitone higher (in Schumann's 'Paradise and the Peri,') the trumpet in B♮, sounding a semitone lower, (Wagner: March in 'Tannhäuser,') and the trumpet in A, sounding a minor third lower (Schubert, 7th symphony). It is well to remember that the higher crooks on the trumpet are more brilliant than the lower ones.

395. The tone of the trumpet is the most powerful and brilliant of any in the orchestra, so much so that a single note on it can be readily distinguished through the mass of other instruments. Its quality is noble, and it is greatly to be regretted that in modern orchestras it is so frequently replaced by the much more vulgar cornet. It is capable of considerable gradation of tone, but it must be remembered that it is difficult to subdue the higher notes, owing to the pressure of wind that they require. It is advisable not to write above [music example] in a pianissimo. It must also be remembered that, the higher the crook, the more difficult the upper notes become.*

* The difference in quality between the horn and the trumpet is partly due to the cylindrical tube of the latter instrument, but still more to the different shape of the mouthpiece.

396. Stopped notes, though possible, are not employed on the trumpet, owing to their bad quality, but the mute (*sordino*) is occasionally used, as on the horn (§359). An effective instance of its employment will be seen in the first finale of 'Die Zauberflöte.' In 'Die Meistersinger' Wagner has used the trumpets with mutes *ff*, in order, as he says in the score, "to imitate the comic effect of toy trumpets." (See within, Ex. 203.)

397. To obtain other notes than the natural notes on the trumpet, more than one modification of the instrument is in use. Of these the best, as regards purity of intonation and quality of tone is the Slide-Trumpet, an instrument not known on the continent. It is peculiar to this country, and is unfortunately falling into disuse even here. The slide is a double tube, like that of the trombone, but much shorter; by drawing it out the pitch of a note can be lowered either a semitone or a tone, as desired. If the student examines the harmonic series given in §342, he will see that the slide will give a complete chromatic scale upwards commencing at . The C♯ below this note cannot be produced, as the E would have to be lowered to the extent of three semitones; the scale is also incomplete between G and C (Nos. 3 and 4 of the series), the A♮ and A♭ being wanting. But, in spite of this deficiency, the instrument is most valuable. The quality of the tone is in no way affected by the slide, as it is by valves, while perfect intonation is possible for nearly every note, the only exception being , which is always slightly sharp.



THE VALVE-TRUMPET.

398. Much more generally used than the slide-trumpet is the Valve-Trumpet. All the explanations given above (§§375-379,) in speaking of the valve-horn apply equally to the valve-trumpet; no details of its mechanism are therefore required. But, though all notes within its compass are *possible* for it, it is just as important to write vocally for the trumpet as for the horn. The most effective passages for the trumpet, whether with or without valves, are those in which the open notes predominate. This will be seen in the examples now to follow. We shall first take some solo passages for the trumpet.

399. The commencement of the allegro of the overture to 'Fra Diavolo'

Ex. 161. *Allegro.* **AUBER: 'Fra Diavolo.'**

Tromba 1º in D.

Viol. 1, 2
Viola.

pp

V'cello.
(senza C'basso.)

shows a trumpet solo, composed entirely of the open notes, 3, 4, 5, 6, and 8, of the harmonic series, which is as simple as it is effective.

400. Our next illustration is given because it was written expressly for the slide-trumpet.

Ex. 162. **E. PROUT: 'Alfred.'**

Tempo di Marcia.

Corni 1, 2, in F.

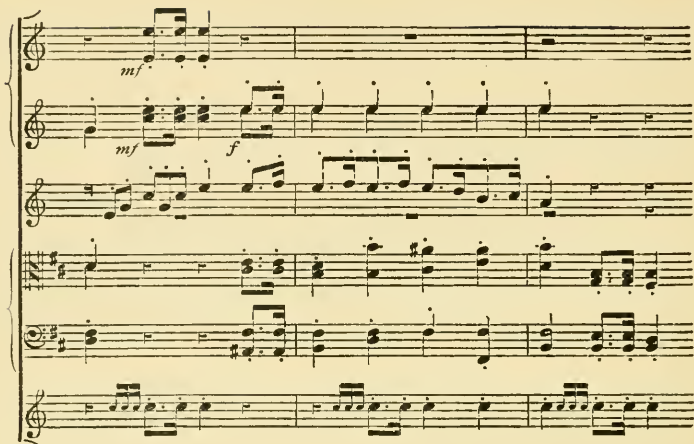
Corni 3, 4, in D.

Trombe in D.

Tromboni 1, 2.

Trombone 3. Tuba.

Tamburo Militare.



The 'tamburo militare' on the lowest staff is the side drum. Notice in the last two bars of this passage that the F—the eleventh harmonic—which is naturally much too sharp, can be produced in perfect tune by slightly drawing out the slide. The B♮ and A♮ are obtained from the eighth and seventh harmonics respectively.

401. Great brilliancy is obtained by two trumpets playing in unison, as in the following passage.

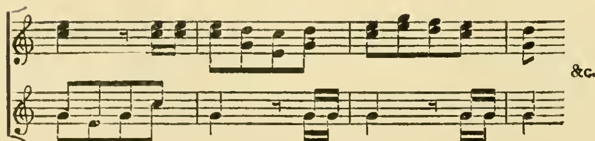
Ex. 163. ROSSINI: 'Guillaume Tell.'

Allegro

Corni in E.

Trombe in E.

ff



402. The trumpet is no less useful in *piano* than in *forte* passages. Its brilliant and penetrating tone tells with wonderful effect through the harmony. Every one will remember the commencement of the bass air in the second part of the 'Creation':—

Ex. 164. HAYDN: 'Creation.

403. An even more beautiful effect, of a somewhat similar character, is seen in Mozart's 'Thamos.'

Ex. 165. MOZART: 'Thamos.

Here the combination of the two flutes with the soft notes of the trumpets and drums, against the sustained A of the soprano is extremely fine. Notice also the *pizzicato* of the violins doubled, in the latter half of the passage, by the two bassoons in unison.

404. The number of trumpets employed in the orchestra is generally two, but a larger number is not unusual, especially in dramatic music. Handel has three trumpets in 'Judas

Maccabæus,' the 'Dettingen Te Deum,' and the 'Occasional Oratorio,' while the score of 'Rinaldo' has four. Bach uses three much more frequently than two, and four will be seen in the cantata "Christen, ätzet diesen Tag." Wagner has three in all his later works; Mendelssohn also has three in the Wedding March of the 'Midsummer Night's Dream' music, and in his 'Meeresstille' overture. In 'Les Huguenots' are parts for four—two natural, and two valve-trumpets. Additional trumpets on the stage are often introduced in opera. There are four such in the first finale of Weber's 'Euryanthe,' and Wagner in the second act of 'Tannhäuser' and the third act of 'Lohengrin' has no fewer than twelve. In all such cases, so far as we are aware, the parts for the trumpets on the stage are confined to fanfares or flourishes. We give a fine example by Verdi.

Ex. 166.

Allegro sostenuto. Verdi: 'Otello.'

Trombe 1, 2, in C.

Trombe 3, 4, in C.

Trombe 5, 6, in C.

We see here a rare instance (in modern music, that is,) of the use of the upper C—the 16th harmonic, for the first trumpet.

Notice the very striking effect, at the fifth bar, of the flat seventh of the scale, played *ff* by four trumpets in unison. Observe also that the notes next below the first trumpet are given, not to the second, but to the third—the higher trumpet of the second pair. What was said in § 355 about the first and second horns applies equally to the trumpets.

405. We spoke in §§ 390, 391 of the use of the highest notes of the trumpet by Bach and Handel, and of the distinction between 'Principalbläser' and 'Clarinbläser.' The latter seem to have been found even toward the close of the last century; probably the latest example of the use of these extreme notes is in a series of little pieces written by Mozart for two flutes, five trumpets and four kettle-drums. As these pieces are very little known, and extremely curious, our readers will thank us for quoting the second part of one of them.

Ex. 167.

Allegro moderato. MOZART: 8 Pieces, No. 1.

Flauti.

Trombe 1, 2, in C.

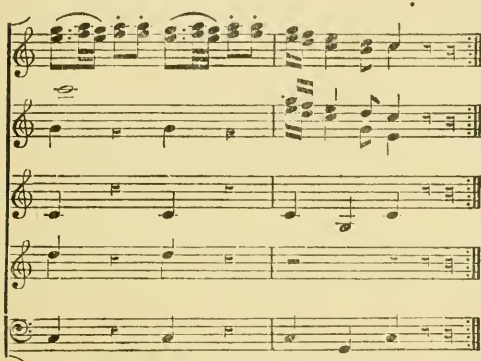
Tromba 3 in C.

Trombe 4, 5, in D.

Timpani in C, G, D, A.

pp

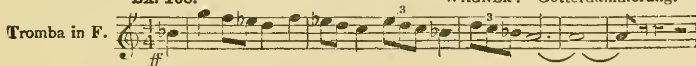




The bass of the harmony is here given to the kettle-drums, which, as the student will learn later (Chap. XI.), are able to give a distinct note. Observe that the notes which are out of tune (Nos. 11 and 13 of the harmonic series,) are mostly used as passing notes of small value.

406. It is very seldom that the upper C seen in the last two examples is found in modern music. Wagner, however, has used it occasionally; but he takes it as the 12th harmonic on the trumpet in F, as in the following passage:—

Ex. 168. WAGNER: 'Götterdämmerung.'



Another instance will be seen in the prelude to 'Parsifal.' The note is difficult to get, and, indeed, extremely risky except with first-rate players. We recommend students not to write the upper G for the trumpet in any key higher than E♭.

407. In Wagner's 'Ring des Nibelungen' he has written a part for the BASS TRUMPET. This is an instrument the pitch of which is an octave lower than that of the trumpet, and therefore in unison with the horn. It is provided with three valves, like the ordinary valve-trumpet. Its tone, however, has none of the nobility of the true trumpet, but rather resembles that of an inferior trombone. Wagner writes for it in the keys of E, E♭, D, and C, noting the part in the G clef. As the instrument is not used in the ordinary orchestra, it is needless to give examples of its employment. Those who are curious about it can consult the scores of the 'Ring des Nibelungen.' We know of no other works in which it is to be found.

CHAPTER X.

BRASS INSTRUMENTS: THE CORNET, TROMBONE, TUBA, &c.

408. In the last chapter we dealt with those brass instruments in which the higher upper partial tones of the tube were employed ; we have now to speak of the more numerous class in which only the lower notes of the series are available, those in ordinary use ending with No. 8. The reason why it is always difficult, and often impossible to sound the notes of the upper octave of the series on the instruments now to be treated of is that in all of them the diameter of the tube is much wider in proportion to its length than on the horn or trumpet (§343). This difference in proportion has also a considerable influence on the quality of tone of the instruments of this group.

409. All the instruments now to be noticed have the same scale of natural notes :



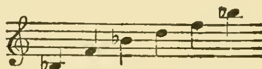
If the student will compare this series with that of the horn and trumpet given in the last chapter (Ex. 143), he will see that the notation is an octave higher than in that example. This point will be explained when we come to speak of the cornet. He will also notice that we have not included the B flat (No. 7 of the series). The reason is, that though it is quite *possible* to obtain it on all the instruments of which we have to speak, it is never required, as the note is out of tune, and can be obtained by other means, all the instruments possessing a complete chromatic scale.

410. There are three different ways in which notes not on the natural scale of these instruments are obtained. In the larger number they are produced by valves, as with the valve-horn and valve-trumpet. This mechanism is used for the cornet, euphonium, tuba (bombardon,) and the whole family of saxhorns. In this case the valves open communication with additional lengths of tubing, thus lowering the pitch, and producing a new fundamental series. On the trombones the same result is obtained by means of a slide. The third method, now

almost obsolete, is that of shortening the column of air in the tube by opening holes in the side of the instrument, as we have already seen in the case of the wood instruments (Chaps. VI. to VIII.). The formerly popular key-bugle was played in this way; the only survivor of the group is the ophicleide, and even this is only exceptionally to be met with, being now almost entirely superseded by the tuba. It will be convenient to treat these instruments, not in the order of classification just given, for some of them are seldom employed in the orchestra; we shall therefore speak first of those most frequently to be met with.

THE CORNET-À-PISTONS.

411. The CORNET-À-PISTONS (usually called simply the 'Cornet,') is a conical tube of brass, about 4½ feet long, of wider bore in proportion to its length than either the horn or trumpet, played with a cup-shaped mouthpiece. Its natural scale is that of B flat—



(Compare § 409.) The fundamental tone (No. 1) is never used.

412. As the tube of the cornet in B♭ is only half the length of that of the trumpet in the same key, it follows that its fundamental tone will be an octave higher. The notes which in §409 we marked as 2, 3, 4, &c., would, *at the same pitch* on the trumpet, be 4, 6, 8, &c., of its series. The student will easily see why the cornet is much easier to play than the trumpet. On the latter instrument each note in the upper octave is produced with a different embouchure; on the cornet only four, instead of eight, are natural notes.

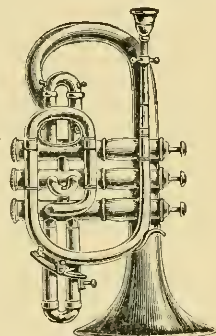
413. The intermediate notes (diatonic and chromatic,) of the scale are obtained on the cornet by means of the pistons from which it derives its full name. The mechanism of these pistons is exactly the same as that already fully explained in speaking of the horn (§§375–377) and their effect is to give the instrument a complete chromatic scale from to

414. We said just now (§411,) that the natural scale of the cornet was that of B flat. Like the horn and trumpet, it is furnished with crooks for other keys. Those now in use are in A, A♭, and G, but only the first-named of these is frequently employed, the tone with the lower crooks being of inferior quality. Other crooks were also formerly used. In Auber's 'Les Diamans de la Couronne' are parts for cornets in C and

in F, and in the same composer's 'Le Lac des Fées'* and 'La Part du Diable,' cornets in E flat are employed. The tone of the instrument in these lower keys was bad, and they are now entirely disused; players transpose the parts for the cornets in B flat.

415. The notation of the cornet differs from that of the horn and trumpet in the fact that the key-signature is always marked. It is invariably written in the G clef, and as a transposing instrument. As we advise the student only to write for cornets in B flat and A, the transpositions and key-signatures will be exactly the same as those for the A and B clarinets shown in Ex. 125. The upper staff in that example (clarinet in C,) shows the real signature of the music.

416. The cornet, owing to the facility of the production of its tone, is capable of greater execution than any other brass instrument. Rapid passages of almost all kinds, shakes, iterated notes, played by 'double-tongueing' as on the flute,† are equally possible. Many readers will remember the florid cornet solos (variations on the 'Carnival of Venice,' &c.,) which the once very popular player, Mr. Levy, used to perform at Promenade Concerts.


THE CORNET-À-PISTONS.

417. The tone of the cornet is absolutely devoid of the nobility of the trumpet, and, unless in the hands of a very good musician, readily becomes vulgar. It is, however, so much easier to play than the trumpet, that parts written for the latter instrument are very often performed on the cornet. In some cases, especially in provincial orchestras, this may be a necessity, as it is not always possible to find trumpet players; but it is none the less a degradation of the music. We cordially endorse the dictum of M. Gevaert, who says,‡—"No conductor worthy of the name of artist ought any longer to allow the cornet to be heard in place of the trumpet in a classical work."

418. Nevertheless, the cornet is not without its uses in the orchestra. In light opera it can sometimes be employed with advantage, and in dance music it is in its proper place. The

* In this work are found parts for two trumpets in addition to two cornets. The same thing may be seen in other modern French scores, but it is comparatively seldom that both instruments are employed at the same time.

† 'Double-tongueing' is also possible on other brass instruments, but is seldom, if ever, required in orchestral music. On brass instruments the free action of the tongue is not impeded, as on the oboe, clarinet, or bassoon, in which the reed is actually in the player's mouth.

‡ *Nouveau Traité d'Instrumentation*, p. 286.

examples we shall now give will show how it can be appropriately introduced.

419. Our first illustration is by Meyerbeer.

Ex. 169. *Allegro.* MEYERBEER: 'Les Huguenots.

Fagotti.

Corno 1, in A.

Corno 2, in E.

Corni 3, 4, in D.

Cornetto 1º in A.

Tromboni 2, 3, e Ophicleide.

Tromb. 2, 3. *unis.*

Oph.

Gran Cassa e Piatti.

Tamburo Militare.

The 'Gran Cassa e Piatti' are the big drum and cymbals, the notation of which will be explained in the next chapter. For the 'Tamburo Militare' compare Ex. 162. Here the cornet solo is accompanied by brass instruments *of a different tone colour*—the quality of the horns being more subdued than that of the cornet. It will be seen that the horns are crooked in three different keys (§362). This is because Meyerbeer is employing the natural, not the valve-horn. In a modern score the part of the first horn would probably be written for the valve-horn in E.

420. Our next example, taken from the Kermesse scene in Gounod's 'Faust'

Ex. 170. Gounod: 'Faust.'

Allegretto.

Corni in F.
Cornetto 1, in B♭.
Trombone 1.
Tamburo Militare.
Viol. 1, 2.
Viola. Bassi.

&c.

is somewhat similar in the character of the cornet solo, but quite differently accompanied. The orchestration is here so clear as to need no comment.

421. The cornet can also be effectively used in more sustained melodies.

Ex. 171. *Poco Andante.* Meyerbeer: 'Les Huguenots.'

Fagotti. (Trombone 3, col Fag. 1, Ophicleide, col Fag. 2.)
Cornetti in Ab.
Viola.
Bassi.

mf e stacc. *mf* div. *mf* Viol. 1, 2. &c.

422. Our last example for the cornet shows its use in combination with other brass instruments, giving full harmony.

Ex. 172. *Allegretto moderato.* Meyerbeer: 'L'Africaine.'

2 Corni Ventile in D.
2 Cornetti in A.
Tromboni 1, 2
Trombone 3 e Ophicleide.

dolce. *fp* *cresc.* unis.



If the student writes for the cornet in his scores, he will do well to allot to them passages of a broad and dignified character, such as are seen in our last two quotations, to counteract, as far as possible, the inherent coarseness of the instrument.

423. The cornet-à-pistons of which we have been speaking must not be confounded with the 'cornetto' so often to be found in the scores of J. S. Bach. This was an instrument of wood, pierced with holes, like a flute or oboe, but played with a mouthpiece like that of a trumpet, instead of with a reed. Bach mostly uses it to make four-part harmony with the three trombones, when the voices are doubled by wind instruments, chiefly in his chorals. Only in two instances is an independent part written for the instrument. One is in the cantata "Es ist nichts gesundes in meinem Leibe"; * the other is in the cantata "O Jesu Christ, mein's Leben's Licht." As the latter is the solitary instance in Bach of an entire work accompanied by wind instruments only, it will interest students to see the opening bars.

Ex. 173. J. S. BACH: Cantata, "O Jesu Christ, mein's Leben's Licht."

Litui, 1, 2.

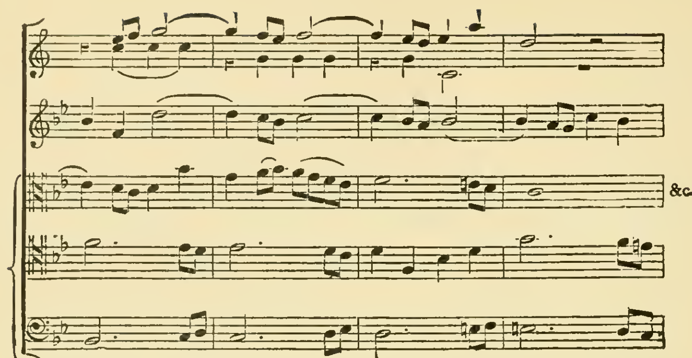
Cornetto.

Trombone 1.

Trombone 2.

Trombone 3.

* The whole movement is given in full score at p. 221 of the author's *Fugal Analysis.*



Nothing definite is known as to the 'Litui' seen on the upper line of the score. The word was the Latin name for the curved trumpet, and an examination of the parts shows that the Litui were natural instruments—probably either horns in B flat *alto* or trumpets in B flat. The old cornet, known in France as the 'cornet-à-bouquin,' or goat-horn, and in Germany as 'Zinken,' made its last appearance in opera in Gluck's Italian 'Orfeo' (1764)

THE TROMBONE.

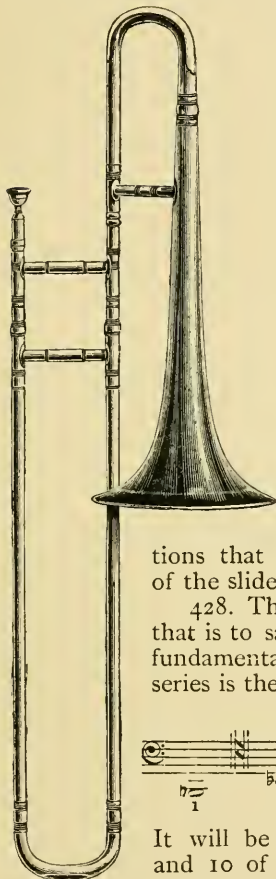
424. The TROMBONE (*Ger.* Posaune, *Fr.* and *Ital.* Trombone,) though an instrument which has been long known,* has only during the present century become a regular constituent of the orchestra. The name is the Italian augmentative of the word 'tromba,' and means literally "great trumpet." It will, however, be seen directly that it differs from that instrument in some important respects.

425. The trombone is a brass tube, cylindrical, like that of the trumpet, through the greater part of its length, provided with a bell, and played with a cupped mouthpiece. As will be seen from the accompanying engraving, the tube is bent in a different way from that of the trumpet. The object of this will be shown directly. The tube is also wider in proportion to its length than that of the horn and trumpet. This gives a fuller and richer, though less brilliant tone than that of the trumpet, to the instrument, and also makes the upper notes of the harmonic series more difficult to obtain, while rendering possible the production of the fundamental tone (No. 1 of the series,) which cannot be sounded on either the horn or the trumpet.

426. The trombone possesses one great advantage over all

* It is described by Mersennus in his 'De Instrumentis Harmonicis (1636) under the name of 'Tuba tractilis.'

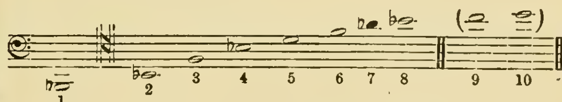
other brass instruments, in that absolutely perfect intonation is possible throughout its entire compass. This is due to the *slide.* The upper part of the tube, nearest the mouthpiece, is made double, the one part sliding on the other, so as to lengthen the tube. We have already seen this arrangement with the slide-trumpet (§ 397) ; but on that instrument, owing to the tube being twice bent on itself, only a limited extension of its length is possible. On the trombone, on the other hand, the shape of which is different, it is possible to lengthen the tube by nearly one half, so as to lower the pitch to the extent of six semitones. As the slide is absolutely under the control of the player, perfect intonation is possible in every key.



THE TROMBONE.

427. There are several varieties of the trombone, differing only in the length of their tubes, and consequently in their pitch. As the mechanism of all is precisely similar, we shall treat first of the tenor trombone, as that which is most frequently met with. The explanations that we are about to give of the action of the slide apply equally to all other trombones.

428. The TENOR TROMBONE stands in B flat ; that is to say, that, when the slide is closed, its fundamental tone is B flat, and its harmonic series is the following :



It will be seen that we have marked Nos. 9 and 10 of the series in brackets. These notes, though possible to a good player, are difficult, and seldom, if ever, written in orchestral music. The fundamental note (No. 1,) usually called a "pedal" note, is rarely employed, and only for special effects. We have marked No. 7 with a black head, because, as we already know, it is a little too flat ; it is, moreover, never *necessary* to use it, as the seventh harmonic can always be obtained, as we shall see directly, in another way.

429. When the slide of the trombone is closed, the instru-

ment is said to be in its *first position.* By gradually drawing it out, six other positions are obtained. In the second position the pitch is lowered a semitone—that is to say, the instrument stands in the key of A ; with the third position it is lowered a tone, and so on, lowering the pitch by a semitone with each new position, till we reach the seventh and lowest, when the instrument will stand in E♮. The following table shows the notes obtainable in each position.

Ex. 174.



The pedal note (No. 1 of the series,) cannot be produced in the lower positions—below the fourth.*

430. If the student will examine the above table, he will see that many notes can be obtained in more than one position. Thus B flat, the fourth harmonic in the first position, is also the fifth harmonic in the fifth position ; while D, the fifth harmonic in the first position, is the sixth harmonic in the fourth, and the seventh harmonic in the seventh position.† The position which a player chooses will depend upon the context ; he will always select that one which requires the least change in the position of the slide. But in the lower octave of the instrument only one position is possible for each note ; and the composer must avoid writing rapid passages which require great changes in the position. We quote from M. Gevaert's work, to which we have so often referred, an example showing passages which would be impracticable in an *allegro.* The numerals above each note show the position in which it has to be taken.

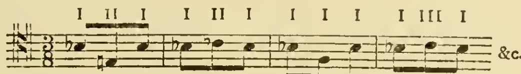
* Examples of the employment of the pedal notes of the trombone may be seen in Berlioz's 'Faust' (pp. 356, 357 of the full score,) and in the "Hostias" of the same composer's 'Requiem.' Berlioz has quoted the latter passage in his 'Instrumentation' (p. 155 of the English translation). The occasions for the suitable introduction of pedal notes are extremely rare.

† In certain passages it might be best to play this note as the seventh harmonic ; the flat intonation would be readily corrected by slightly drawing in the slide.

Ex. 175.
Allegro.



Such passages *an octave higher* would offer little or no difficulty; *e.g.*



431. Rapid passages of any kind, besides being ill-suited to the nature of the trombone, are difficult, except such arpeggios as can be played in one position of the slide, *e.g.*



We can give no instance of the writing of such passages as this in the works of the great composers, simply because the character of the instrument is solemn and dignified. But in solos for the trombone they may sometimes be met with.*

432. If the student will compare the table of positions given in Ex. 174 with that of the effect of the pistons of the horn shown in §377 (Ex. 154), he will see that the different positions effect exactly the same transpositions as the pistons, employed separately or combined. Like the valve-horn, the trombone has a complete chromatic scale, excepting between Nos. 1 and 2 of its series. The highest pedal note is separated from the lowest note of the seventh position by an augmented fourth. But from to the chromatic scale is complete. The trombone, however, is a far more perfect instrument than the valve-horn. Not only is its intonation more perfect, but its tone is purer. This is because the drawing out of the slide makes no difference in the form of the vibrating air-column, but affects only its length. But when a piston is pressed down on a horn, the air is diverted into a side channel—it has, so to speak, to go round sharp corners; consequently its form is changed, it is no longer uniform in shape, and the tone becomes less pure.

433. Though the tenor trombone, of which we have been speaking, is the only one to be found in the orchestras of

* R. Hofmann, in the sixth book of his 'Instrumentation,' quotes two remarkably florid passages from concertos for the trombone by Ferdinand David and C. Belke.

France and Italy, two other varieties are employed in this country and in Germany. These are the alto and the bass trombone. Except in pitch, they exactly resemble the tenor trombone, and will therefore need no lengthened description.

434. The ALTO TROMBONE is a perfect fourth higher than the tenor, its fundamental note, with the slide closed, being E flat. The pedal notes of this instrument have never, so far as we know, been employed. Its tone, though somewhat less powerful than that of the tenor trombone, is also brighter, especially in its upper notes. Its compass is from to with all the intermediate semitones; but its lower notes are of inferior quality, and are, besides, not needed, as they lie in the medium of the tenor trombone. Its upper notes, on the other hand, are far superior to the same notes on the tenor, and it is to be regretted that the instrument is not always to be found in our orchestras.

435. The BASS TROMBONE is made in three different sizes. That most used in this country is in G, a minor third below the tenor trombone, its compass being from to . In Germany, and occasionally also in this country, a bass trombone in F is met with, having a compass from to . It is to be wished that the use of this instrument were more general, as we not seldom find the low C written by the great masters for the bass trombone; and, as the note is not on the G trombone, it has to be transposed an octave. A bass trombone in E flat, (compass to ,) is also sometimes found in Germany; but we can only recall two instances in which it is imperatively required. In the chorus "Tui nati vulnerati" of Dvořák's 'Stabat Mater' is an important low B flat for the third trombone, which is impracticable on the trombones in G and F. The same note is also found in Brahms's 'Rinaldo.'

436. The bass trombone is a fatiguing instrument, as it requires a large amount of wind; the student must therefore be careful in writing for it to allow plenty of rests. The pedal notes are not used. In other respects, its treatment, as also that of the alto trombone, is the same as that of the tenor. In

using the example given above (§430,) to avoid too great changes of position, the student must transpose the passage a fourth higher for the alto trombone, and a minor third lower for the bass trombone in G—the only one that he can rely upon getting in this country.

437. In addition to the three trombones already mentioned, a SOPRANO TROMBONE formerly existed. This seems to have been in B flat, an octave above the tenor trombone; its compass would therefore be the same as that of the cornet in B flat, viz.: from [music notation] to [music notation]. It is found in some of Bach's church cantatas, where it doubles the soprano voice in the chorals*; but the only instance we have met with of its later employment is in the 'Kyrie' of Mozart's unfinished Mass in C minor, where there are parts for four trombones, that for the soprano being written in the C clef on the first line.

438. In the enormous majority of cases three trombones are employed in the orchestra. In France and Italy, as mentioned above, these are three tenor trombones, in England and Germany, either alto, tenor, and bass or two tenors and bass. Instances of the employment of more or fewer than three will be referred to later.

439. There is no instrument in the orchestra as to which there is so much diversity of practice, as regards notation, as the trombone. In one respect it differs from all the brass instruments hitherto treated; it is always written at its real pitch, as a non-transposing instrument. The older masters mostly gave a separate staff to each trombone, using the alto, tenor, and bass clefs (Mozart: 'Don Giovanni,' second finale; Beethoven: Finale of symphony in C minor, Mass in D, &c.). In modern scores two staves are more frequently employed, the alto and tenor trombones being written on the one and the bass trombone on the other. Either the alto or tenor clef is used for the two upper trombones, the former being the more common, probably because fewer leger lines are required if the part for the alto trombone lies high. If there are two tenor trombones, instead of an alto and a tenor, the tenor clef is of course adopted. Examples of this will be seen in Wagner's later scores, though he sometimes, when the parts lie low, writes all the trombones in the F clef (*e.g.* in the Prelude to 'Tristan und Isolde'). When the trombones are

* It is probably the same instrument which is found in some of Bach's scores under the names of 'Tromba da tirarsi' and 'Corno da tirarsi' (*i.e.* slide-trumpet, and slide-horn), which was evidently not a true trumpet or horn, as Bach writes for it as a non-transposing instrument.

written on two staves, and there is also an Ophicleide or Tuba in the score, this instrument is often written on the same line with the bass trombone. (See Ex. 162.)

440. We said in §438 that in France and Italy only tenor trombones were used. The result is that, their compass being more limited, French and Italian composers generally write for them in a rather close position, and mostly put the three instruments on the same staff. This is occasionally done also by German and English writers, for the sake of saving a line in the score. When this method is employed, either the tenor or the bass clef is used, according to the position of the chords, and the clef is changed when needed, to avoid many leger lines. Sometimes, even, the ophicleide or tuba is written on the same staff with the three trombones, as in the following extract from the overture to 'Le Siège de Corinthe.'

Ex. 176.

Allegro vivace. ROSSINI: 'Le Siège de Corinthe.'

3 Tromboni e Ophicleide.

ff

Notice an illustration here of what has just been said as to the close position of the three tenor trombones. It is much better in general to use two staves for the trombones, especially if there is any independent movement of the parts.

441. The tone of the trombone is very broad and dignified in the *forte*, solemn and impressive in *piano*. Young composers are apt to use it too freely for the sake of making a noise. An examination of the examples that we are about to give, as well as of some that have been already quoted (see Exs. 100, 140, 169, 170, 172,) will show that this is far from being its principal function in the orchestra.

442. It must be remembered that, as with other brass instruments, the intonation of the trombone depends entirely on the player. His hand, lip, and brain must work perfectly together. If the slide be an eighth of an inch out of its proper position, the intonation is false. It is therefore just as important as with the horn and trumpet that the player should hear in his mind the note he is going to produce; unvocal intervals should consequently be avoided as far as possible.

443. Our first illustration will show the employment of the trombones by themselves. Examples of this procedure are somewhat rare.

Ex. 177. SCHUBERT: 'Des Teufels Lustschloss.'

Largo.

Tromboni 1, 2.

Trombone 3.

p *fp*

Schubert had a great predilection for the trombones, which he mostly treated with extreme felicity, though sometimes (as in some movements of his Masses in A flat and E flat,) he employs them too persistently to double the voice parts of his choruses. It must be said that the *legato* marked here for the trombones is not entirely possible, except between such notes as can be played in one position of the slide. Another fine example of the employment of unaccompanied trombones will be seen in Beethoven's '3 Equali,' three short pieces written for four trombones—two alto, a tenor, and a bass.

444. In our next example

Ex. 178.

Andante. SPOHR: 'Jessonda.'

Corni 1, 2, in F.

Corni 3, 4, in C.

Trombe in F.

Tromboni 1, 2.

Trombone 3.

CHORUS (TENOR).

f

Gott I - xo - ra! Gott I - xo - ra! Lass dem Auge das im Sonnen -

- feu- erflammt, sinnbe·thörend, markver - zehrend auf der Fein-de Schaar-en ruhn.

we see full harmony for the whole mass of brass instruments accompanying the tenor chorus. This is one of the commonest methods of employing the trombones ; their rich and sonorous tone blends admirably with that of the horns and trumpets.

445. We now give some illustrations of the use of the trombones *piano;* our first is by Schubert.

Ex. 179.

All°. molto moderato. Schubert : 'Rosamunde.'

Fagotti. *pp*

Corni in D.

Tromboni 1, 2. *pp*

Trombone 3. *pp*

Viol. 1, 2. *unis.* *pp*

Viola. *pp*

V'cello. C'basso. *pp*

f pp

f pp

f pp

f pp

f pp

f pp

f pp

Nobody who has ever heard the first Entr'acte in 'Rosamunde' will have forgotten the magnificent effect of the soft chords for the trombones accompanying the melody played in octaves by the strings.

446. Our next quotation, again from Schubert, shows an equally fine, though quite different, employment of trombones.

Ex. 180. SCHUBERT: 7th Symphony.

Allegro ma non troppo.

Wood. Horns. Clar. Fag. Cor. pp Fl. Ob. Clar. Fag. Cor.

3 Tromboni. a 3. pp

Viol. 1º. pizz. pp

Viol. 2do. pp

Viola. pp

V'cello. div. pp

Basso. pizz. pp

Fl.
Clar.
Fl.
Ob.
Fag. Cor.
Ob.

Clar.
Fl.
Fag. Cor.
Ob

To save space, we have condensed the wood and horns on one staff. The strings could not be compressed without sacrificing clearness. This passage will repay close examination. Notice not merely the unison of the three trombones,* but the

* Here we see '*a* 3' used in the opposite way to that shown in Ex. 57, to indicate that the part is played by three instruments in unison. Compare § 223.

alternate pizzicato of the first violins and double-basses, and the contrasts of colour in the chords for the wood.

447. The *pianissimo* of the trombones is often employed for the expression of mystery and terror, as in the following passage from the air of the chief vestal, in the first act of Spontini's 'La Vestale.'

Ex. 181. SPONTINI: 'La Vestale.'

Allegro molto.

Fagotti. *a 2.* *ppp*

Corni in D. *pp*

3 Tromboni. *ppp*

Viol. 1, 2. Viola. *ppp*

LA GRANDE VESTALE.

Sur des tom - beaux, sur des a - by - mes son trô - ne san - glant est......... fon - dé.

Bassi. *ppp*

&c.

448. A very fine example of *staccato* chords *pp*, for the trombones is the following :

Ex. 182. *Andantino.* AUBER: 'Gustave.'

Clarinetti in B.

p

Fagotti.

p

3 Tromboni.

pp

Viol. 1, 2. Viola.

pizz.

p

ARVEDSON.

VOICE.

Je sais un ma-gi - que breu-

Bassi.

pizz.

p

- va - ge d'un in - fallible ef - fet.

AMÉLIE.

Au prix de tout mon or, te -

- nez et cent fois plus en-cor.

&c.

Note here the effect of the contrast of the short chords for pizzicato strings and trombones with the sustained harmony of the clarinets and first bassoon.

449. For our last quotation we give a very striking passage in which the trombones are used to accompany a melody played by the cor anglais and the first bassoon in unison.

Ex. 183. WAGNER: 'Tristan und Isolde.'

Poco lento.

Cor Anglais. *pp* *p* *pp* *p* &c.

Fagotto 1º. *pp* *p* *pp* *p* &c.

3 Tromboni. *pp* *p* *pp* *p* &c.

ISOLDE. Der Mutter Rath gemahnt mich recht Wil-kom - men

We had noted many more passages for quotation; but, as the present work is a text-book, not an encyclopædia, we must content ourselves with those already given, and refer students to the scores of the great masters for others. Mozart has treated the trombones most effectively in the second act of 'Don Giovanni,'* and in the Priests' music of 'Die Zauberflöte.' In Beethoven's Mass in D, the 'Benedictus' contains some very fine accompaniments for trumpets and trombones, *pp*, while Wagner's scores abound in passages in which these instruments are brought into prominence. To name but one, every one knows the close of the 'Tannhäuser' overture, in which the Pilgrims' chorus is intoned *ff* by three trumpets and three trombones in unison against the rapid scale passages of the strings.

450. Formerly the trombone was much used in church music to double the voices throughout the choruses. Excepting in two passages, one of which was quoted and the other referred to in §423, Bach never employs them in any other way. Mozart treats them in the same manner in some of his masses, and in his Litany in E flat. But it must be remembered that such a procedure is very likely to overpower the voices, and we do not recommend it for imitation.

* The accompaniment of the solo "Di rider finirai" seems to have been suggested by that of the Oracle in Gluck's 'Alceste.'

451. Though, as already said, three trombones are generally employed, this practice is not invariable. In Haydn's 'Passione' only two (alto and tenor,) are used; while Beethoven in 'Fidelio' has only tenor and bass. In some scores, mostly in French operas, only one trombone is to be found. This is the case in Boieldieu's 'La Dame Blanche,' and in Cherubini's 'Lodoiska' and 'Les Deux Journées.' A single trombone (tenor,) is introduced by Schumann at the end of his 'Concert Allegro,' Op. 134, for piano and orchestra; and the well-known trombone obligato in the "Tuba mirum" of Mozart's 'Requiem' is also written for the tenor trombone.

452. We have already referred to the employment of four trombones in Mozart's Mass in C minor and in Beethoven's 'Equali'; four are also to be seen in Schumann's 'Neujahrslied,' and in Auber's overture written for the Exhibition of 1862. These are quite exceptional cases, and the student had better write only for the usual three.

453. In the 'Ring des Nibelungen,' Wagner, in addition to the three usual instruments, has a part for a *Contrabass Trombone*, an enormous instrument, the pitch and compass of which is an octave below the tenor trombone (§432). He uses it mostly in the lower register, to obtain the deepest notes of the bass, writes it, like the other trombones as a non-transposing instrument, and writes for it as low as [musical example]. As it has never, so far as we know, been employed in any other work, it is only necessary to mention it.

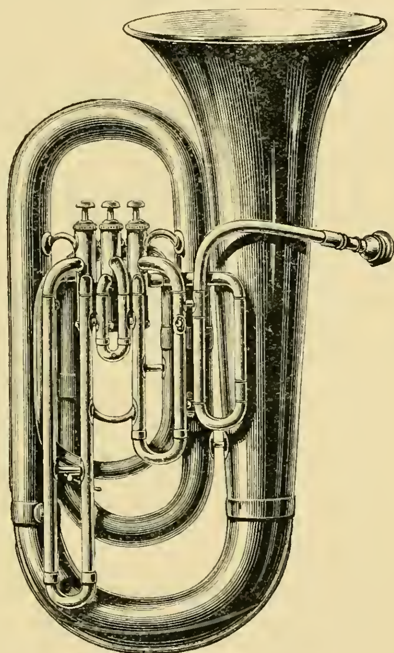
454. In some military bands, perhaps also occasionally in the orchestra, the VALVE TROMBONE is used instead of the slide trombone. This instrument has rather a wider bore than the slide trombone, and is provided with three pistons, which act in the same way as on other valve instruments. Naturally it is easier to play, and possesses more rapid execution than what we may call the legitimate instrument; but these advantages are more than counterbalanced by the decided inferiority of the quality of its tone. It will be an evil day for the orchestra, if this instrument should ever supplant the noble slide trombone.

THE TUBA.

455. THE TUBA (often indicated in scores as 'Basstuba,') is an instrument belonging to the family of Saxhorns, so named after their inventor, the instrument maker, M. Sax, of Paris. The other instruments of the same class are used only in military bands, and need not detain us here; but the tuba plays so important a part in many modern works that some details about it are necessary.

456. The tuba is a brass instrument, played with a mouthpiece similar to that of the trombone, and furnished with valves or pistons. To the three pistons already described in speaking of the horn (§§ 375, 376), a fourth is added which lowers the pitch by a perfect fourth. From what was said in § 379 the student will readily see that when this fourth piston is used with others the note will be too sharp. The player, however, is able to some extent to correct this by his blowing. By means of the fourth piston a complete chromatic scale can be obtained through the entire compass of the instrument.

457. The tuba is made in three sizes. The smallest, often called the *Euphonium*, is in B flat, an octave below the cornet, and therefore in unison with the tenor trombone. Its compass for orchestral purposes is from to . A few notes more are possible at each end of this scale, but the highest notes are difficult, and the lowest ones weak.



THE TUBA.

458. The tuba more frequently used is that generally known under the name of the *Bombardon*. It is pitched in E flat, a fifth lower than the euphonium, and its lower register is fuller and richer.

459. The CONTRABASS TUBA, or Bombardon in B flat, is in pitch an octave below the Euphonium. Its use is almost exclusively confined to military bands; but Wagner introduces its low notes with great effect in 'Der Ring des Nibelungen,' writing for it down to . (See 'Siegfried,' p. 9 of the full score.)

460. The tuba, like the trombones, is always written as a

non-transposing instrument. Its tone is full and rich, intermediate in quality between the horn and the trombone. It blends admirably with other brass instruments, which is one reason why it has now almost entirely supplanted its immediate predecessor, the ophicleide, of which we shall speak presently,* other reasons being its more extensive compass, and the greater facility with which it is played.

461. The suitable employment of the tuba will be best understood by the examples now to be given. In the first

Ex. 184.

Allegro feroce. E. PROUT: 'The Red Cross Knight.'

Corni 1, 2, in F.

Tromba 1 in E♭.

Tromboni 1, 2.

Trombone 3. Tuba.

MORICE.

mf

I tram-ple it down as the grass that I tread.

it doubles the bass trombone in the lower octave, thus performing the same function for the brass which the double-bass does for the strings. It is seldom that the tuba is written quite so low as here; but the passage is not difficult on the Bombardon (§458), though it would be much less effective on the Euphonium. The trumpet part was written for the slide-trumpet (§397), but can, of course, be quite as easily played on the valve-trumpet.

462. In our next illustration the low G of the bass trombone and tuba in octaves serves as bass to the strings. The passage requires no further explanation.

* M. Lavoix, in his *Histoire de l'Instrumentation* (p. 442), states that in the Bibliothèque Nationale of Paris there is a collection of Berlioz's scores containing autograph corrections by the composer, and that in these he has nearly everywhere marked the tuba in place of the ophicleide.

DVOŘÁK: 1st Symphony.

Ex. 185.

463. A very effective combination is that of the tuba with the three trombones, making four-part harmony for the brass alone. Many instances of this are to be found in the scores of Wagner. We give a fine passage from the finale of Tschaïkowsky's 'Symphonie Pathétique.'

Ex. 186. TSCHAÏKOWSKY: Symphonie Pathétique.

Andante. *poco rallentando.* *quasi Adagio.*

Tromboni 1, 2. Trombone 3. Tuba.

p mp p p mp p pp p pp ppp pppp ppppp

Here, as in Ex. 133 from the same work, the exaggeration of *nuances* is pushed almost to an absurdity. A simple *diminuendo* for the last two bars would have answered every purpose.

464. The last example we shall give of the employment of the tuba

Ex. 187. SCHUMANN: 'Der Königssohn.'

Feierlich (solemn).

Corni in D. Trombe in D. Tromboni Alto e Tenore. Trombone Basso. Tuba. Timpani in D, A.

p pp tr

is somewhat similar to the last, but with the addition to the score of horns, trumpets, and drums. Of the treatment of the last-named instruments we shall speak in the next chapter.

465. The student must not forget that the tuba is not a *regular* constituent of the orchestra, in the same way in which the trombones are. It will therefore be inexpedient for him to write a part for it in his scores, unless he is certain of being able to get it if his work is performed. Besides this, it is very seldom indispensable, and, with a little skill he will be able to get quite sufficient colour and variety without it.

466. Before leaving the tuba, we must say a word about the extra tubas which Wagner introduces in the scores of the 'Ring des Nibelungen' but which have not, so far as we know, been employed elsewhere. These are a modification of the saxhorn, similar in character and tone-quality to the tuba of which we have been speaking. Wagner employs four,—two tenor-tubas in B flat, an octave below the cornet in B flat, and two bass-tubas in F, a fourth below the tenor-tubas.* Unlike the ordinary tuba, they are written as transposing instruments. In the same work Wagner also employs a contrabass-tuba (§ 459). It is needless to enter into details concerning these exceptionally-used instruments.

THE OPHICLEIDE.

467. Though now seldom, if ever, written for, the Ophicleide has in its time played so important a part in the scores of the great masters during the first part of the present century, that it must be noticed here. It was first introduced into the orchestra in 1817, in Spontini's 'Olympie,' and is to be found in some of the scores of Mendelssohn ('Midsummer Night's Dream' and 'Elijah,') and in many operas of Rossini, Auber, Meyerbeer, and other French composers.

468. The ophicleide, which is the bass of the formerly very popular Keyed Bugle, differs radically in its construction and mechanism from any of the brass instruments of which we have been speaking. In all hitherto dealt with, alterations in the fundamental scale of the tube were obtained by lengthening it ; in the ophicleide, on the other hand, the column of air in the tube is shortened by opening holes in the side, exactly as with wood wind instruments. Fuller explanations are superfluous, as the instrument is now almost entirely disused. It will suffice to say that two varieties of ophicleide

* For the sake of students of these scores, it should be said, that while in 'Das Rheingold' the tuba parts are written in B flat and F, Wagner writes them in 'Die Walküre' and 'Siegfried' in E♭ and B♭, in order, as he says, to make the score easier to read,—which it hardly does. In 'Götterdämmerung' he writes them again in B♭ and F. For an example of their employment, see Ch. XI., Ex. 193. The contrabass-tuba is never written as a transposing instrument.

have been used in the orchestra,—one in C, having a compass extending chromatically from [music] to [music], the other in B flat, a tone lower. The F clef was always used in the notation, and even when the ophicleide in B flat was required, because of the employment of the two lowest notes (A♮ and B♭), it was mostly written as a non-transposing instrument.*

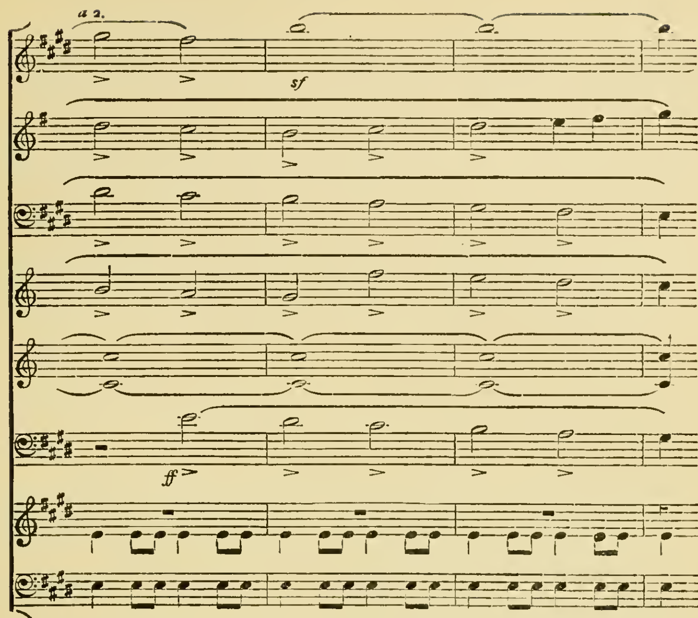
469. The tone of the ophicleide is very powerful, but somewhat savage and obtrusive. It blends far less well with the trombones than the tuba, which has now generally replaced it. Yet its very assertiveness has at times been turned to good account by composers; one of the best examples being the following:—

Ex. 188.

Allegro di molto. Mendelssohn: 'Midsummer Night's Dream.'

Flauti e Oboi *unis.*
Clarinetti in A.
Fagotti.
Corni in E.
Trombe in E.
Ophicleide.
Viol. 1, 2. Viola.
Bassi.
ff
a 2.
unis.
Viola

* The only exceptions we have met with to the general practice are in the works of Berlioz, who in his 'Symphonie Fantastique' and 'Messe des Morts' has two ophicleides, one in C and one in B flat; the latter is written as a transposing instrument. a tone higher than it sounds.



In the last three bars of this passage, the effect of the "bellowing tones" (to use M. Gevaert's expression,) of the ophicleide is admirable; neither the trombone nor the tuba would adequately replace it. Another excellent example of the dramatic employment of the ophicleide will be seen in Schumann's 'Paradies und die Peri.' The passages are, unfortunately, too long for quotation; we must refer students to Nos. 6 and 23 of the score. But in the majority of cases (*e.g.* in Exs. 169, 171, 172, 176,) the ophicleide would be advantageously replaced by the tuba, on which the part would generally be played at the present day.

470. It remains to say a few words about two bass instruments, both now obsolete, which, though neither was of brass, belong to the family now under notice. These were the Serpent and the Bass Horn. We mention them because both have been employed in past times by the great masters.

471. THE SERPENT was a wooden tube, about eight feet in length, played with a cup-shaped mouthpiece like that of a trombone. It derived its name from the peculiar curved shape in which the tube was twisted, to bring it more easily within reach of the player's hands. It was the last survivor of the old family of cornetti (*Ger.* Zinken,) spoken of in § 423, and, like the ophicleide, had holes in the side of the tube for

shortening the column of air. Its compass was the same as that of the ophicleide in C (§ 468). It was an imperfect and somewhat unmanageable instrument, of a powerful and rather rough tone. Beethoven employs it once—in his March for a military band in D major, and Mendelssohn writes for it in 'St. Paul' and the 'Meeresstille' overture. Probably the latest instances of its introduction into a score are in Wagner's 'Rienzi' and 'Das Liebesmahl der Apostel.' *

472. The Bass Horn (*Ital.* Corno Basso,) was another instrument of a somewhat similar character; the tube was of wood, but with a brass bell at the end; it was sometimes also made of brass, and was furnished with keys like the ophicleide. Its compass was from [music notation] to [music notation]. Spohr has written for it in his Notturno, Op. 34, and his ninth symphony, and Mendelssohn in his overture, Op. 24, and his Funeral March, Op. 103. It is now entirely superseded by the tuba.

* The serpent is now so entirely obsolete that when, some years ago, the author was arranging for a performance of 'St. Paul,' he was unable to find a player on the instrument in the whole of London, and the part had to be played on a tuba.

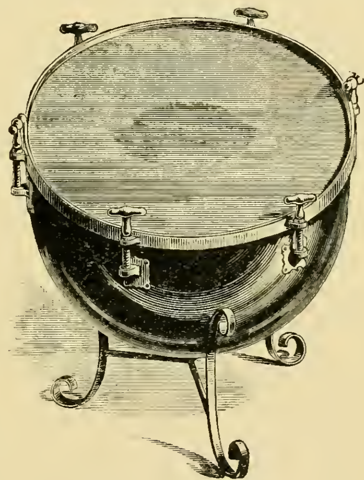
CHAPTER XI.

INSTRUMENTS OF PERCUSSION.

473. The various instruments of percussion, of which a list was given in § 40, are, with the exception of the kettle-drums, of much less importance, and much more rarely used in the orchestra, than those dealt with in preceding chapters. As said in Chapter II., they are of two classes—those in which the sound is produced by the vibration of a stretched membrane (the family of drums), and those in which the sound results from the vibration of metallic bodies (bells, triangle, &c.). We shall first speak of the drums.

THE KETTLE-DRUMS.

474. The KETTLE-DRUMS (*Fr.* Timbales, *Ger.* Pauken, *Ital.* Timpani,) are hemispheres of copper, (sometimes of brass,) over the top of which is stretched a parchment, known as the "head." Round the edge of the drum are screws by which the head can, within certain limits, be tightened or loosened at the pleasure of the performer. The instruments are played by two drumsticks, the heads of which are generally made of felt, though occasionally, for special effects, drumsticks with wooden or sponge heads are prescribed by the composer. The kettle-drums are frequently spoken of merely as "the drums"; and, in writing of orchestral music these instruments are always meant when "drum" is mentioned without any qualifying term, such as "big drum" or "side drum."



THE KETTLE-DRUM.

475. The kettle-drums possess one very great advantage over all other instruments of their class, in that they are capable of producing a distinct musical note, while other drums produce only a noise. The pitch of the note depends upon the tightness or looseness of the drum head, which is regulated

by the screws referred to above. The note is produced by the vibration of the head itself, and is reinforced by the body of air in the drum, which acts as a resonator. The average compass of a good drum is a perfect fifth.

476. A kettle-drum player is always provided with at least two drums of different sizes; in modern orchestras he frequently has three. The larger drum has a compass from , the smaller from ; if there are three drums, the third will be intermediate in size between the two first named. The kettle-drum part is always noted in the F clef.

477. Occasionally the compass just given is exceeded by composers. The low E is very rare, as the tone is poor when the head is so loosened; but the upper F♯ is not infrequently met with (Schubert, Symphony in B minor; Mendelssohn, 'St. Paul'; Schumann: 'Paradies und die Peri'). In the first chorus of Rossini's 'Stabat Mater,' the upper G is written for the smaller drum; but in performance drum players mostly play the note an octave lower on the larger drum (instead of). The reason is, that if the head is screwed too tight there is great risk of splitting the parchment. Even the upper F♯ cannot be relied upon, unless the head is of exceptionally good quality.

478. The drums were formerly chiefly used in *tutti* passages, with the trumpets, and, down to the time of Beethoven, were always tuned to the tonic and dominant. The general custom of the older composers was to treat them, like the horns and trumpets, as transposing instruments, writing the notes C and G, and indicating the key thus:—

Timpani in D, A &c.

which would here sound a tone higher than written. This method, which, however, was not universal,* had its disadvantages. If, for example, 'Timpani in F, C,' were directed, the player could either tune or , and there would be the same ambiguity with 'Timpani in B♭, F.' At the present day, when any kind of tuning is adopted for the drums, it is of course necessary to write them with their real sounds. If the notes are flats or sharps, it is not usual to write accidentals either in the signature or before the notes. For instance,

* Handel writes the actual notes for the drums, excepting in one or two of his earliest scores; and in the old edition of Haydn's masses, published early in this century, the drums are written as non-transposing instruments.

Ex. 189.

Marcia. *Maestoso.* Mozart: 'La Clemenza di Tito.'

Trombe in E♭.

Timpani in E♭, B♭.

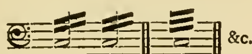
&c.

This extract not only shows the notation of the drums, but illustrates a common way of treating them. Here they give the bass of the harmony (compare Ex. 167). But it is sometimes advisable to mark the accidentals, especially if the tuning of the drum is altered a semitone in the course of a movement. A good example of this will be seen in the chorus "Thanks be to God" in 'Elijah.'

479. We have just spoken of changing the tuning of the drums in the course of a movement. This is frequent in modern music; when it is required a few bars' rest must be given, to allow the player time to alter his screws. Some of the more recently made drums are provided with a patent mechanism, by means of which the turning of a single screw changes the pitch almost instantaneously; but, as such drums are not in general use, the composer cannot depend upon getting them.

480. As each drum sounds only one note, the instruments were formerly mostly used for rhythmic effects; of these we shall give examples presently. It should be remembered that it is better not to use the drums excepting in harmony of which they form one of the notes—not necessarily the bass. This point is sometimes disregarded by composers; but the effect is not good. For instance, in Ex. 187, at bars 2 and 3, the D of the drum is no part of the harmony of the first crotchet; it would have been much better if Schumann had taken the other drum here, for A is part of the harmony throughout.

481. The *Roll*, or *Tremolo*, is much used on the drums, and is most effective, both in *forte* and *piano*. It was formerly generally written



the former being used in an *allegro*—in a slow movement it would not be a roll, but simply repeated semiquavers. It

would be needful then to use the sign for demisemiquavers. In modern works the roll is usually written



482. Occasionally, for special effects, the composer directs that the drums shall be muffled. This is generally indicated by the Italian '*timpani coperti*,' and is effected by covering the head of the drum with a cloth, which subdues the sound by interfering with the free vibration of the parchment. An example will be seen in the first finale of 'Die Zauberflöte.'

483. The older composers seldom used the drums for solo passages. One of the earliest examples of their treatment in this way is to be seen at the commencement of Bach's 'Christmas Oratorio.' The passage is interesting enough to deserve quotation.

Ex. 190. J. S. Bach: 'Christmas Oratorio.

Allegro.

Flauti 1, 2.

Oboi 1, 2.

Tromba 1° in D.

Timpani in D, A.

Viol. 1°.

Bassi e Fagotti.

&c.

484. Beethoven was the first to recognize the real artistic position of the drums in the orchestra. With him they become individualities, and passages of great importance are often assigned to them. His scores are so easily accessible that we content ourselves with referring to some of the more salient examples, and select our illustrations from works which the student is less likely to meet with. We call his attention to such passages for the drums as those at the end of the scherzi of the Eroica and C minor symphonies, in the slow movement of the fourth symphony, the opening of the violin concerto, and the "Dona nobis" of the mass in D, in which last, for

a special effect, the drums are in B flat and F—a key quite foreign to that of the movement.

485. To Beethoven also is due the innovation of tuning the drums otherwise than to the tonic and dominant of the key. In the introduction to the second act of 'Fidelio' they are tuned to a diminished fifth (A♮, E♮), and in the finale of the eighth and the scherzo of the ninth symphony, they are tuned in octaves (F, F). Every one knows the marvellous effect of the [musical example] for the drums absolutely unaccompanied in the latter work. Modern composers have followed Beethoven's lead in this respect, and write for the drums whatever notes they are likely to want most in the course of the movement. Thus Mendelssohn in the first chorus of the 'Walpurgis Night' has the drums in C♯, A, in his Capriccio in B minor, Op. 22, they are in D, E, and in his unfinished 'Christus,' we find them in one chorus in G, F, and in another in B♭, D. Many similar examples could be given from the works of other composers.

486. Before proceeding to speak of the employment of more than two drums, we will give a few characteristic passages from standard works illustrating the treatment of the usual pair. Our first is from Bizet's 'Carmen.'

Ex. 191. BIZET: 'Carmen.'

Andantino molto.

Corni 1, 2, in E♭. *pp*

Corni 3, 4, in B♭ *basso.* *pp*

Trombone 1. *pp*

Timpani in E♭, B♭. *ppp*

487. Our next illustration shows the drums supplying the bass to a group of wind instruments.

SCHUBERT: 7th Symphony.

Ex. 192.

Allegro vivace.

Flauti.

Oboi.

Clarinetti in C.

Fagotti.

Corni in C.

Timpani in C, G.

p

a 2.

We cannot too strongly recommend to students the careful analysis of the score of the symphony from which the above passage is quoted. Excepting one miscalculated effect at the end of the first movement, to which we shall refer when we come to treat of balance of tone, the orchestration is throughout most masterly, and every page deserves attention.*

* The score is published both by Peters and in Donajowski's Miniature Scores

488. Our next example shows the effect to be obtained by a solo of a strongly marked rhythmical character.

Ex. 193.

Moderato.

WAGNER: 'Die Walküre.'

2 Tenor Tuben in E♭.

2 Bass Tuben in B♭.

Contrabass tuba.

Timpano in C.

V'cello e Basso.

p marcato.

p

più p

C.B.

V'c.

&c.

Those who know 'Die Walküre' will at once recognize the rhythm of the 'Hunding motive' in the drum solo here. The effect, when the drum is perfectly in tune, is very striking, and quite impossible to obtain from any other instrument. This passage also shows the employment of the tubas spoken of in §466. The tenor tubas, like horns in E flat, transpose a major sixth lower, the bass tubas a tone lower; the contrabass tuba is non-transposing.

489. With the solitary exception of the little pieces by Mozart, part of one of which was quoted in Ex. 167, and which can hardly be regarded as orchestral music properly so called, we know of no example of the employment of more than two drums earlier than Weber, who uses three in his overtures to 'Peter Schmoll' (1807,) and 'Der Beherrscher der Geister' (1811). In modern scores they are often to be found. Mendelssohn has three in 'St. Paul,' Schumann in his first symphony, Raff in his third, and Tschaïkowsky in his 'Symphonie Pathétique,'—to name but a few instances. Meyerbeer also employed three in his later operas (see Ex. 69). Even where only two drums are written for, our best players usually provide themselves with three, for the convenience of tuning, and Wagner specially recommends this in 'Tristan,' though he nowhere in that work employs three drums together.

490. The object of the third drum is to have one available for other chords than those which contain the tonic or dominant as one of their notes. We said above that the most general tuning for two drums was the tonic and dominant of the piece. The third drum may be tuned to almost any other note of the scale. In Ex. 69 the third drum has the subdominant. In the chorus "The nations are now the Lord's," in 'St. Paul,' the key of which is B♭ major, the three drums are in B♭, D, F. Other tunings will be seen in the passages to be quoted directly. But any notes can be taken which the composer may require. An extreme instance of this will be seen in Tschaïkowsky's 'Symphonie Pathétique.' The first movement is in B minor, and modulates freely. The three drums, which are not used till the 52nd bar of the *allegro*, are first tuned to A, E, E♭; in the course of the movement the tuning is changed, first to C, D, E, then to G, D, A, and lastly to F♯, B, E.

491. Solo passages for three drums are very rare; we give two examples of them. The first is the commencement of the scherzo of Spohr's 'Historical Symphony.'

Ex. 194.

Scherzo. SPOHR: 'Historical Symphony,' Op. 116.

3 Timpani in G, D, E♭. *p*

Viol. 1.
Viol. 2. *pp*

Viola. *pp*

V'cello. pizz. *pp*

Here, after the first two bars, the drums are reinforced by the pizzicato of the violoncellos, but, in the hands of a good player, the notes would be quite distinct on the drums alone.

492. The scarcity of examples must be the author's apology for introducing another example from his own pen.

Ex. 195.

Poco Allegretto. E. PROUT: 3rd Symphony.

3 Timpani in D, A, E. *ff* *ff* *ff* *ff*

Orchestra. *Tutti.* *ff* *ff* *ff* *Str.* *p* *Tutti.* *ff* &c.

To save space, the full orchestra is condensed on two staves. Here the solo for the drums, *ff*, is entirely unaccompanied.

493. Occasionally even more than three drums are employed in the orchestra. In 'Der Ring des Nibelungen' Wagner has two pairs, and Spohr, in the chorus in 'Calvary' depicting the earthquake at the Crucifixion, has six, there being two players with three drums each, the first three being tuned in A♭, A♮, D, and the other three in G, B♮, C. This chorus is probably the earliest instance of the employment of the roll on two drums together—of course one of each set.

494. Something still more elaborate will be seen in the last example we shall give of these instruments. At the end of the slow movement of his 'Symphonie Fantastique' Berlioz wishes to represent a distant peal of thunder. To do this he employs two pairs of drums, with two players to each pair, and has rolls for the drums in chords. The effect is exceedingly realistic.

Ex. 196. BERLIOZ: Symphonie Fantastique.

Adagio.

Cor Anglais.

Timpani in B♭, F. (Two players.)

Timpani in C, A♭. (Two players.)

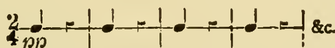
&c.

In his 'Messe des Morts' the same composer has gone still further in this direction. In this work he has eight pairs of drums and ten players, giving rolls with full chords in various positions. The effect in performance is not satisfactory, probably owing to the difficulty of getting perfect intonation on so many drums. Those who are curious in the matter will

find the passage here referred to quoted in Berlioz's 'Instru mentation,' pages 200 to 213 of the English translation.

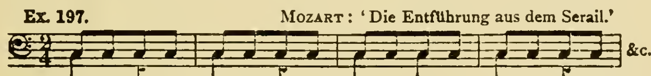
495. In addition to the kettle-drums, two other kinds are sometimes, though far less often, employed in the orchestra. The first of which we have to speak is the Bass Drum* (*Fr.* Grosse Caisse, *Ital.* Gran Cassa, *Ger.* Grosse Trommel). It is needless to give a picture of an instrument so familiar in military and volunteer, to say nothing of Salvation Army bands. It is struck with a larger drumstick than those used for the kettle-drums, and gives a deep and indefinite sound—not a distinct note like the *timpani*. Its use is therefore simply to mark the rhythm, and for this purpose it is generally associated with the cymbals, to be described presently (§516).

496. There is no fixed notation for the bass drum. The part is usually written with the F clef, but it matters not what note is written on the clef. The most common is probably C; but in Ex. 169 Meyerbeer has written F, while in other numbers of 'Les Huguenots' A and E are to be found. In Auber's 'Marco Spada' no clef is used, but at the beginning of the line is ═H══. In some modern scores, (*e.g.* in Liszt's 'Dante symphony') the bass drum, and other percussion instruments having no fixed sound, are written, not on a staff, but on a single line. With this method the part in Ex. 169 would appear thus—



This plan is mostly adopted to save space when the score is very full, but the more usual notation is preferable.

497. A peculiarity of notation, to be occasionally found in the scores of Haydn and Mozart, must be mentioned. We spoke just now of the bass drum being played with "*a* drumstick"; but formerly two, a large and a small one, were sometimes employed. In the chorus of Janissaries, in the first act of Mozart's 'Entführung' the part for the bass drum is written—



The notes with the stems down are for the large drumstick, and those with the stems up for the small one. Evidently the accented notes will be much the more powerful. A similar notation will be found in Haydn's Military symphony.

498. The roll is possible, though not very often employed, on the bass drum. It is sometimes made with a double-headed drumstick, with a knob at each end, called in French a "mailloche." This the player holds in the middle and rapidly

* Occasionally called the "long drum."

strikes the drum with each end in turn. A more satisfactory roll is obtained by using a pair of kettle-drum sticks ; Liszt, in the 'Dante symphony,' referred to above has several rolls, which he expressly directs to be played in this manner.

499. The bass drum is an instrument which should be very sparingly used, and with great discretion, especially if the cymbals are combined with it. We give two examples of its legitimate employment—both without the cymbals. In the first—the final chorus of 'Iphigénie en Aulide,'

Ex. 198. GLUCK : 'Iphigénie en Aulide.'

Andante maestoso.

Grosse Caisse.
(2 Fl. all 8va.)
Viol. 1, 2, e Oboi, *unis.*
Viola e Fagotti, *unis.*
CHORUS. SOPRANO. ALTO.
Par - tons, vo - lons à la vic - toi - re, Par nos
TENOR. BASS.
Bassi.

faits é - cla - tants é - ton - nons l'a - ve - nir.

the bass drum marks the rhythm by striking the first beat

Ex. 199.

Allegro moderato. MENDELSSOHN: 'First Walpurgis Night.'

Flauti. *mf leggiero.*

Clarinetti in B.

Corni in D.

Timpani in G, D. *sempre piano.*

Gran Cassa. (senza Piatti.) *pp*

CHORUS.

TENORE. *mf* Come! Come! Come with

BASSO. *mf* Come! Come!

(Viola all 8va)

Viola. Bassi. *sempre piano.*

p

torch - es bright - ly flash - ing; Rush a - long with bil - lets

Come with torch - es bright - ly flash - ing; Rush a -

Violas.

of each bar throughout the whole movement except the last four bars. The passage is of historical interest, as being the very first introduction of the bass drum into the orchestra.

500. Our second example (see Ex. 199, on last page,) shows a very fine effect of the bass drum *pianissimo*, and requires no further remark.

501. The SIDE DRUM, or Military Drum (*Fr.* Tambour, *Ital.* Tamburo Militare, *Ger.* Rührtrommel, or 'Kleine Trommel,') is another very familiar instrument. It is in England sometimes called the 'Snare-Drum,' from the cords of catgut called "snares" which are stretched on the lower side of the drum, and rattle against it when it is struck. It is played with two wooden drumsticks with small elongated knobs, and has a sharp and incisive quality, difficult to describe in words, but doubtless familiar to all our readers.

502. The notation of the side-drum is similar to that of the bass drum, which it resembles in its uncertainty. The G clef is used for it quite as often as the F clef, and any note may be written. Instances of its employment will be seen in Exs. 162, 169, 170. Another very excellent example is the opening of Auber's overture to 'Fra Diavolo,' which begins with a solo of twelve bars for the side-drum alone. Sometimes, to obtain a duller tone, the strings which tighten the head are directed to be slackened. This is indicated by the French as "avec la corde relâchée" and in German by "schlaff gespannt." Wagner has used this effect in his 'Ride of the Walkyries.' An example will be seen later in this chapter (Ex. 206).

503. Though not precisely a drum, the TAMBOURINE (*Fr.* Tambour de Basque,) belongs to the family we are now considering. We quote the following description of it from Grove's *Dictionary of Music and Musicians.** "It consists of a wooden hoop, on one side of which is stretched a vellum head, the other side being open. Small rods with fly-nuts serve to tighten or loosen the head. It is beaten by the hand without a stick. Several pairs of small metal plates, called jingles, are fixed loosely round the hoop by a wire passing through the centres of each pair, so that they *jingle* whenever the tambourine is struck by the hand or shaken. Another effect is produced by rubbing the head with the finger."

504. The tambourine is another instrument of indefinite notation. It is seldom, if ever, used except in dramatic, or dance music. One example of its employment will suffice. (See Ex. 200, next page.)

505. The second group of percussion instruments is that in which the tone is produced by the vibration of metallic bodies. These again are divided into two classes,—those which give

* By kind permission of Messrs. Macmillan & Co.

Ex. 200. WEBER: 'Preciosa.'

Moderato ben marcato.

Clarinetti in C.

Fagotti.

Corni in C.

Triangolo.
Tamburo Militare.
Tamburino.

definite musical notes, and those which do not. To the former belong the bells and Glockenspiel; all the other instruments of this group belong to the latter.

506. Bells of various sizes have been used at different times in the orchestra, mostly in dramatic music. The earliest instance of their employment is in Bach's Cantata for an alto voice, "Schlage doch, gewünschte Stunde," which is accompanied by strings and two bells, sounding the tonic and dominant of the key. A short extract will be of interest.

Ex. 201. J. S. BACH: Cantata, "Schlage doch, gewünschte Stunde."

Campanella in E, B.

Viol. 1, 2.

Viola.

ALTO.

Schla-ge doch, gewünschte Stun-de, brich doch au, gewünschter

Continuo

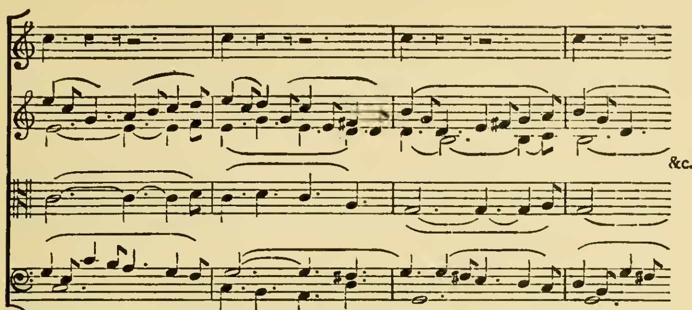


The 'Continuo' on the lowest line of the score indicates, not only that the part was played by the basses, but that the harmonies were to be filled up on the organ or harpsichord. The notation of the bells is curious. By reading the notes in the G clef, we get the sounds required, but are left uncertain as to the octave. The latter half of the passage, in which the bass of the harmony is given to the bells, would suggest that the real sounds were probably . Other examples of the employment of bells in concert music will be found in the finale of Berlioz's 'Symphonie Fantastique,' in the opening scene of Sullivan's 'Golden Legend,' and in Bennett's overture to 'Paradise and the Peri.'

507. On the stage, bells are more frequently used. We may instance the great duet in the fourth act of 'Les Huguenots,' the "Miserere" in 'Il Trovatore,' and the Grail Scene in 'Parsifal,' as examples of their effective employment. We give a less known, but very beautiful illustration,

Ex. 202. *Andantino con moto.* AUBER: 'Le Philtre.'

Bell in G.
Viol. 1, 2. *pp*
Viola. *pp*
V'cello e Basso. V'c. C.B. *pp*



It is not easy to see why Auber did not write G instead of C for the bell; but, as there is only one used, which can give but one note, the notation is of little importance.

508. It is probable that the student will never have occasion to write a part for a bell; but, if he should do so, he must be very careful not to introduce it in chords of which it forms no part; otherwise the effect will be horrible.

509. Another instrument of this group, giving definite notes, is the Glockenspiel (*Fr.* Carillon). Of this there are two kinds. The name, both in German and French, means "peal of bells." The older variety consisted of a number of small bells played upon by a key-board similar to that of a piano. It is used by Handel in 'Saul,' and by Mozart in 'Die Zauberflöte.' In the former work small bells were probably used; but in the score of Mozart's opera* the Glockenspiel is marked as "Instrumento d'acciajo"—*i.e.* instrument of steel. In this, therefore, as in the modern Glockenspiel, small steel bars were substituted for the bells, over which they possess the advantage of being more easily tuned. Both Handel and Mozart write chords for both hands on the instrument.

510. The modern Glockenspiel differs from the older in having no keyboard. It consists of a number of small steel bars placed upon a frame, and struck by a small hammer. The instrument is made of various sizes, its general compass being about from [music] to [music] with all intermediate semitones. It is written in the G clef, and sounds an octave higher than its notation, thus resembling the piccolo. Wagner has made very effective use of this instrument in the final scenes of 'Die Meistersinger' and 'Die Walküre.'

511. As our illustration, we quote the passage from 'Die Meistersinger,' which accompanies the entry of the apprentices with their toy-instruments.

* P. 94, in the complete edition of Mozart's works (Breitkopf und Härtel).

Ex. 203.

Moderato. WAGNER: 'Die Meistersinger.'

Piccolo. *p stacc.*

Flauto 1º

Oboe 1º *p stacc.*

Clarinetto 1º in C.

(Mit Dämpfer und sehr stark geblasen.*)

Tromba 1, in B♭. *f marc.*

Glockenspiel.

Viol. 1. col legno. *p*

Viol. 2do col legno. *p*

Viola. *p* col legno.

V'cello. col legno. *p*

Contrabasso. col legno. *p*

* With the mute, and blown very strongly.

We have selected this passage because it not only shows effective treatment of the Glockenspiel, but furnishes an example of two points already referred to earlier in this volume —the "col legno" for the strings (§ 91), and the imitation of toy-trumpets by the *forte* of the trumpet played with the mute (§ 396).*

512. Of instruments giving indeterminate sounds, we have first to speak of the TRIANGLE (*Ital.* Triangolo, *Ger.* Triangel). This is a bar of steel, bent into the shape of a triangle, and struck with a small steel rod. Its tone is clear and very acute, resembling that of a very small bell. Like the bass drum, it is noted in various ways, sometimes with the C, and sometimes

* The XYLOPHONE, an instrument similar in construction to the Glockenspiel, but with bars of wood instead of steel, is so seldom employed in the orchestra—the only instance known to us being Saint-Saëns's 'Danse Macabre'—that it need not detain us.

with the F clef, while some composers, to save space, write it only on a single line, as shown in § 494. The tremolo, indicated by or *tr*, is made by rapidly striking two sides of the instrument alternately, close to the angle.

513. The triangle is exclusively a rhythmic instrument, and, if judiciously used, is very effective. It is seldom employed in symphonic music, though it may be found in Haydn's Military Symphony, in the finale of Beethoven's ninth, and in the first movement of Schumann's first symphony. But its proper place is rather in lighter orchestral music—dance or ballet music, and on the stage.

514. Our first example of the triangle shows it as a solo instrument.

Ex. 204.

Allegretto vivace. LISZT: Concerto in E flat.

Triangolo. *pp*

Viol. 1º pizz. *p*

Viol. 2do pizz. *p*

Viola. pizz. *p*

V'cello. pizz. *p*

3 3 *marc.* 3 *marc.* 3 &c.

Liszt in his score has written the triangle on one line. We print it, in the more usual manner, on a staff. Here the characteristic rhythm of the principal subject of the movement is announced by the triangle and continued by the strings.

515. No composer has treated the triangle more happily than Auber. We select a well-known passage as our illustration.

AUBER: 'Le Cheval de Bronze.'

Ex. 205.

Allegretto.

Flauto. *dolce*

Clarinetti in B. *dolce.* *p*

Fagotti. *p*

Corni in E♭. *p*

Corni in B♭ basso. *p*

Triangolo. *p*

Viol. 1º *p*

Viol. 2do pizz. *p*

Viola. pizz. *p*

V'cello. Basso. pizz. *p*



516. The CYMBALS (*Fr.* Cimbales, *Ital.* Piatti, or 'Cinelli,' *Ger.* Becken,) are two circular disks of metal, with a hemispherical concavity in the middle, to the outer side of which a strap is attached by which the instrument is held. It is mostly used in combination with the bass drum, and in the majority of scores only one part is written for the two instruments. The tone is produced by striking the two cymbals against one another. To obtain the best quality of tone, one cymbal should be held in each hand of the player; but, as the cymbals and bass drum are generally played by the same performer, one of the cymbals is usually fastened on the top of the drum, and the other is clashed against it. The tone thus produced is far inferior to that which results from the two cymbals being struck, not full, but (so to speak) *grazing* one another, when held in the hands.

517. The notation of the cymbals is indeterminate. Any clef (or none—see § 494) may be used, and any note that the composer chooses serves equally well. Like the bass drum, side-drum, or triangle, the cymbals can be written on a single

line. The older composers mostly used two staves for the bass drum and cymbals; in modern scores both are usually written on the same staff. In this case, it is best and clearest to put double stems to the notes when both instruments are played together,



and if only one is employed, this must be expressly marked, e.g. '*G. C.* (or 'Gran Cassa') *sola*,' or '*senza Piatti*'; in the converse case '*Piatti soli*,' or '*senza G. C.*' The double stems will then of course not be written.

518. The metallic clang of the cymbals is very penetrating, and in a *mf* or *f* will be distinctly heard through the full orchestra. As their vibrations, when unimpeded, continue for some time, it is needful to mark carefully the exact length of note required. If it is desired that the sound should be short, this is usually indicated by the French word "étouffez" (see Ex. 206, within), or in German scores, by "schnell zu dämpfen" ('damp quickly').

519. The cymbals are not solely instruments for making a noise. They can be used, either with or without the bass drum in *piano* or *pianissimo* with excellent effect (see Ex. 169) Gounod employs them in this way in the "Gloria" of his Cecilian Mass, and other examples might easily be found. In the 'Tannhäuser' overture Wagner uses them *forte*, without the bass drum, to depict the revels in the Venusberg.

520. Two other methods of using the cymbals are found in Wagner's scores. By suspending one cymbal and striking it with a bass-drum stick an effect somewhat like that of a gong, but less powerful, is produced. Wagner also uses the roll played on one cymbal, either with a pair of kettle-drum sticks, or with the wooden sticks of the side-drum. In both cases a weird metallic clang is produced. This effect is very rarely employed, and only for dramatic purposes.

521. The GONG (*Fr.*, *Ital.*, and *Ger.* Tamtam,) is an instrument of Chinese origin. It is a circular metal disk, the edges of which are turned over, which is played with a large bass-drum stick. It is more rarely used than any of the instruments we have been describing, and only for very special effects. Its vibrations are very prolonged, and its sinister quality of tone is equally striking in *piano* and *forte*. Cherubini has introduced one stroke on the gong *ff* at the beginning of the "Dies Irae" of his Requiem in C minor, and Meyerbeer has used the instrument *pp* with great effect in the scene of the Resurrection of the Nuns in 'Robert le Diable.' A more recent, and not less felicitous example of its employment may be seen in No. 14 of Dvořák's 'Spectre's Bride.'

Ex. 206. SPONTINI: 'Fernand Cortez.'

Allegro feroce.

2 Piccoli.
2 Clarinetti in C.

Corni e Trombe, in D.

3 Tromboni.

Timpani in B, F♯.

Grosse Caisse.
Tamtam.

Tambourin.
Cimbales (étouffés).

Tambour.
(avec la corde relâchée.)

Viola.
Basso.

ff sf sf p trem. mf ff f p f p trem.

522. For our last example (see Ex. 206, on last page,) we quote the commencement of the barbaric music in the second act of Spontini's 'Fernand Cortez,' because it introduces nearly all the instruments of which we have been speaking in this chapter. Excepting the timpani and the strings, all the instruments here are on the stage. The effect in performance must be an overpowering din, which is doubtless what the composer intended. We see here illustrations of two points previously mentioned—the damping of the sound of the cymbals (§ 516), and the loosening of the cords of the side-drum (§ 500).

523. We most strongly urge the student to be very sparing in the use of all the instruments named in this chapter, excepting the kettle-drums. Nothing vulgarizes a score more than the too frequent employment of other percussion instruments, which should never be introduced unless their presence is justified by the character of the music. In the works of the greatest masters they are used with the utmost discretion —in an enormous majority of cases not at all. Let the young composer follow their example.

524. We have now completed our description of the various instruments composing the modern orchestra. It would be a great mistake, however, for the student to suppose that there is nothing more to learn. In this volume we have merely been furnishing him, so to speak, with the colours for his palette. The examples we have given have been mainly selected with the object of showing the individual capacity of each instrument. The important subjects of balance of tone, orchestral colouring, combination, contrast, the accompaniment of voices, and many other points, have been either not at all, or only incidentally touched upon. These will be treated in detail in the second volume of this work.

THE END.

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